PAINT and VARNISH

THE TECHNICAL MAGAZINE FOR MANUFACTURERS OF PAINT, VARNISH, LACQUER AND OTHER SYNTHETIC FINISHE

JUNE, 1957

Now from RCI:

WALLPOL 9120

a PVAc copolymer emulsion with better balance

● RCI now offers you a *brand new* copolymer emulsion which incorporates the latest advances in PVAc emulsion technology. Through a uniquely balanced emulsifier system this new PVAc product, WALLPOL 9120, combines two outstanding properties. They are:

1. **Excellent stability** — and that means both thermal stability and package stability. You'll also find that, compared to competitive copolymer products, WALLPOL 9120 causes less bodying during pigmentation.

2. **Excellent water resistance**—obtained in this new RCI copolymer emulsion by *small particle size* and the exceptional balance of other physical properties. You won't find *any* competitive copolymer that is better balanced to permit both high pigment loading and good performance.

Besides unusual stability and water resistance, performance qualities of WALLPOL 9120 include *exceptional tenacity and toughness* (achieved via its high molecular weight) and *superior elasticity, elongation* and *flexibility*.

Why not see what you can do with this new RCI copolymer emulsion in *your* PVAc formulations? Discover what product stability and what tough, flexible, water-resistant films you can secure with WALLPOL 9120.

Where your formulas call for a homopolymer emulsion, try WALLPOL 9301, a Reichhold PVAc that's easy to work with and offers high performance properties. WALLPOL 9301 is widely accepted for durable exterior masonry paints, interior flats and primer sealers.

An RCI technical service man will be glad to talk over any PVAc problems you may have. Or, if you wish, just write for full information on the new copolymer emulsion, WALLPOL 9120. Ask for *Technical Bulletin SC-18*.

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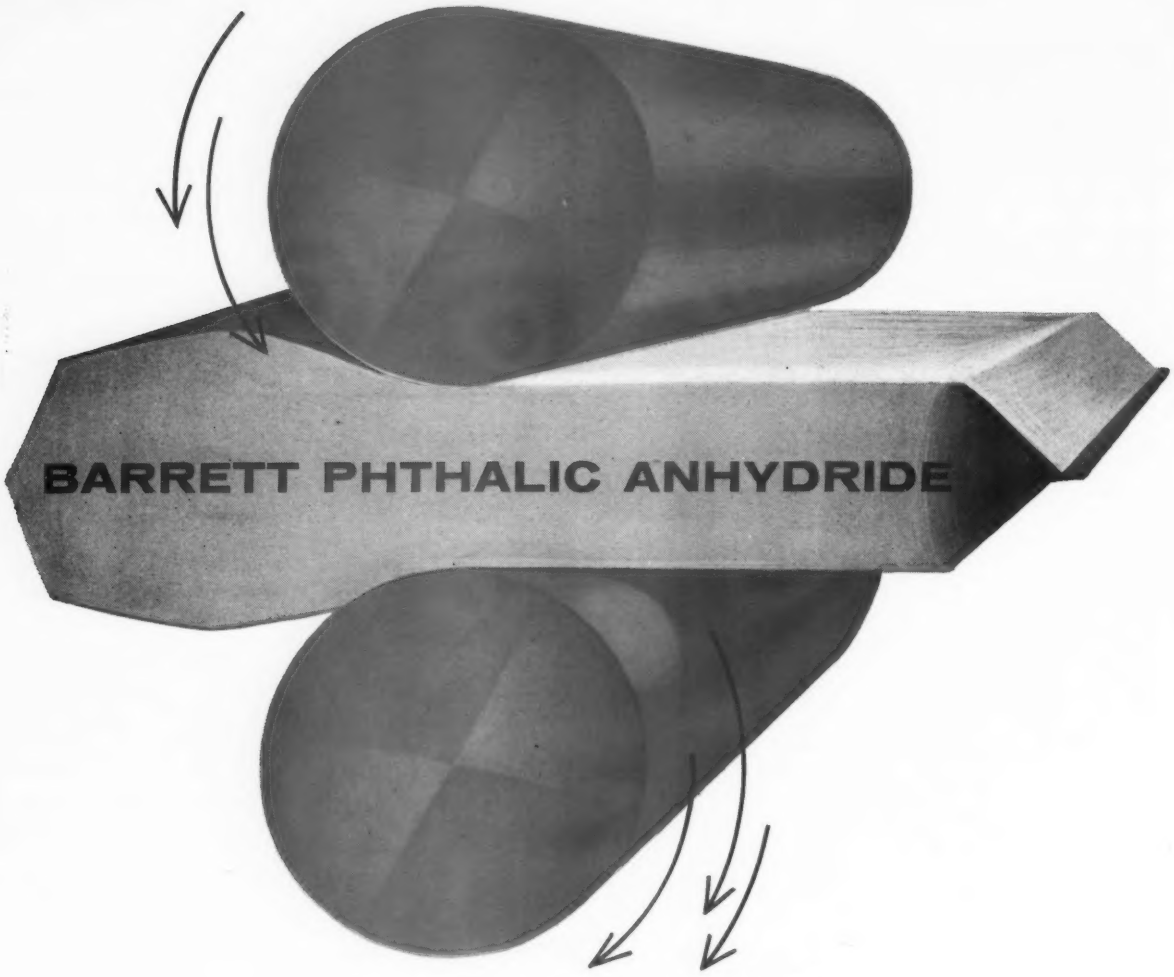

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Formerly PAINT and VARNISH PRODUCTION MANAGER
(Established in 1910 as The Paint and Varnish Record)

VOL. 47 JUNE, 1957 NO. 7

NEXT ISSUE

Consideration in the processing of pentaerythritol alkyds will be featured in the July issue. This article is based on the results of experimental studies concerning to the effect of alcoholysis catalyst concentration, alcoholysis temperature, type of alcoholysis catalyst, and additives for color improvement.

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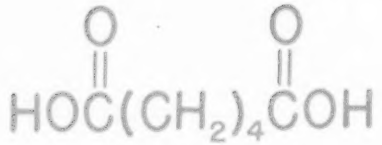

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Selling Incentive Programs

THE success or failure of any incentive program is dependent on how well the program has been sold to employees. The fact that the employees will benefit financially from such a program is no guarantee that an incentive system will work. Basic fears among both supervisors and operators must be overcome before the program is accepted. Generally speaking, these fears are concerned with job insecurity and abrupt operational changes.

In this connection, management should take steps to insure that employees completely understand the value of the wage incentive, and what it means to them and their company. This can be accomplished through an educational campaign which should precede the installation of any incentive program.

In an effort to dispel fears regarding job insecurity, management (through the firm's house organ or by addressing the workers directly) can point out the advantages that both the employees and the company will gain with an incentive program. For example, such a program could help a company to maintain its top competitive position. For the employee this means a chance to lower manufacturing costs and improve delivery schedules—all of which assures steady employment.

Another problem associated with incentive systems is the resistance on the part of the employees to doing their jobs differently. Abrupt changes in methods for the employees who have been accustomed to doing their jobs in much the same way for years may cause some emotional disturbances. These usually can be resolved by personal, sympathetic treatment. Here it is a case of recognizing the employee's difficulties and emphasizing that nothing beyond the person's capacity is required.

In selling the advantages of any incentive plan, it is wise to let your supervisors in on the plan, and more particularly to give them a major role in executing it. Without the wholehearted support of the supervisors, incentive systems could very well fail in any organization. Usually resistance to such a program stems from aloofness on the part of the management in not consulting their supervisors. Moreover, the contributions that supervisors can offer will materially add to the success of any incentive program.

Government Purchases

SOME interesting facts regarding purchases of paint by the Government were revealed at the recent Government Paint Procurement Symposium sponsored by the National Paint, Varnish, and Lacquer Association and held in Philadelphia. The General Stores Supply Office is the largest single buyer of paint products, procuring some 14 million gallons valued at $25-$30 million per year. The Public Housing Administration last year purchased 100,000 gallons of paint. Each year their agency arranges for an annual contract for purchases of paint for 428,000 housing units. The Corps of Engineers, responsible for all military construction and maintenance, has a construction schedule of $1.6 billion and paint requirements for such projects are expected to run over $20 million.

ACETATES Amyl, Normal Butyl, Secondary Butyl, Ethyl, Isopropyl, Normal Propyl

ALCOHOLS Normal Butyl, Secondary Butyl, Isopropyl, Methanol, Proprietary Ethyl Alcohol, Normal Propyl

ALKALIES Caustic Soda, Trisodium Phosphate

ALKANOLAMINES Diethanolamine, Di-Tri-Isopropanolamine, Monoethanolomine, Monoisopropanolamine, Triethanolomine

AROMATIC SOLVENTS Benzol, Toluol-Xylol, Heavy Aromatic, SC Solvents #1, 2, 3, 100, 150, and 450

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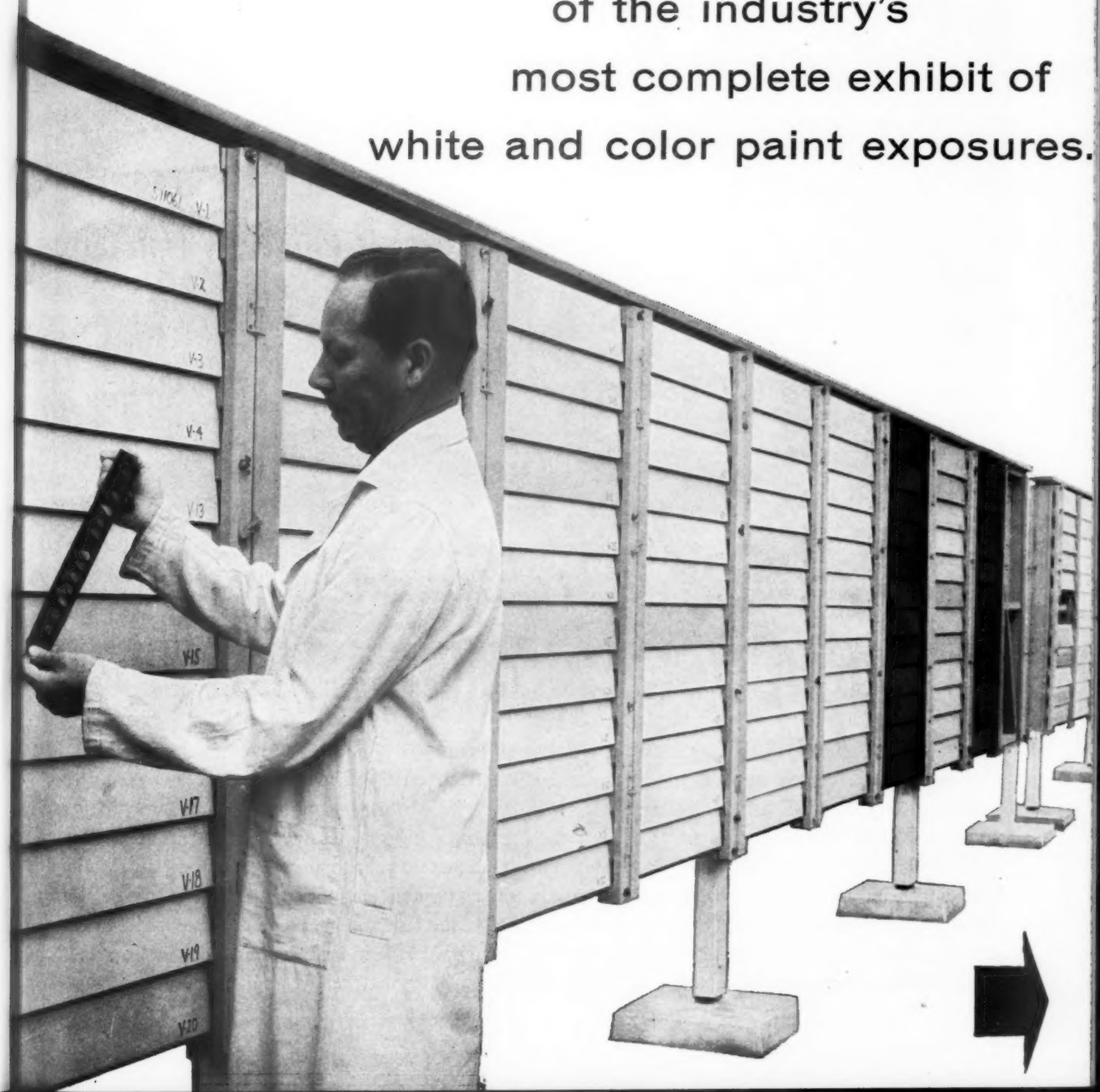

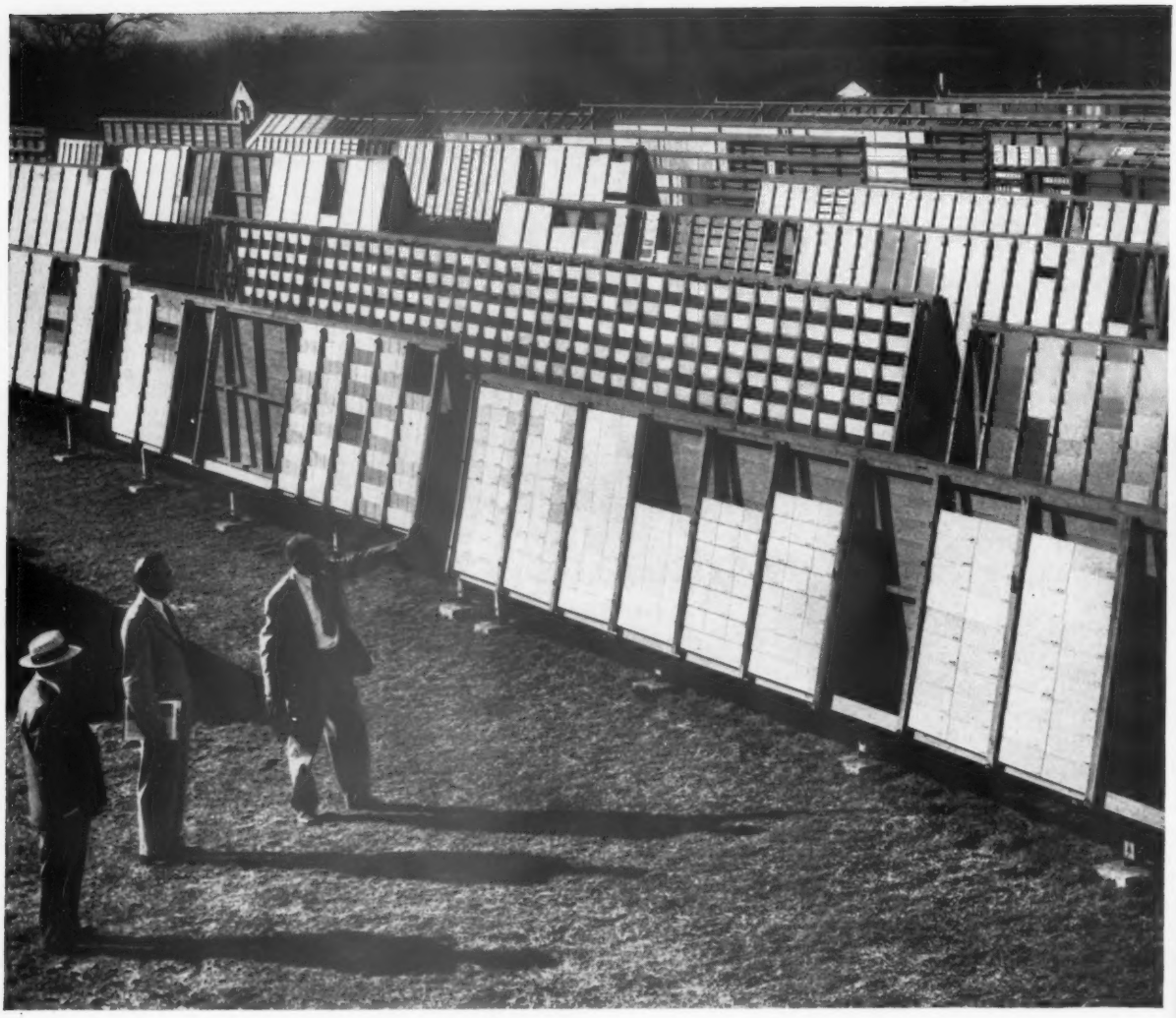

Now's the time to spend a day
AT THE DUPONT PIGMENTS TEST FARM

The Du Pont Pigments Department invites you to review one of the most comprehensive collections of paint exposures available at the test farm located near Wilmington, Delaware. In one visit you can review data on both white and color pigments . . . complete exposure data on oil, alkyd and many of the newer emulsion paint formulations over a variety of substrate. There are also extensive tests on the pigmentation of trim, porch and deck, automotive and other enamel systems.

Every year, hundreds of paint manufacturers visit the Du Pont Pigments Department Test Farm to review the performance of new formulations—to assess exposure histories on the older systems. In the more than 30,000 panels currently under test, you will find many formulations of particular interest to you. Since 1932 this test farm has recorded exposure histories on many widely used formulations. You can learn in one day answers that were years in the making.

For example . . .

You will be able to compare the "washing" characteristics of several paint formulations when used on wood-above-masonry construction.

You will also find many formulations containing pigment colors. Here, the group is discussing the properties of various colored exterior paints.

In our conference room, you will have the opportunity of reviewing the results of your trip or to examine in greater detail items of specific interest at the test farm.

Actual house tests play an important part in our exposure program. Here, you can inspect in-use performance of a variety of formulations, which supplement exposure histories from the test farm.

A SIMILAR TEST FARM AT EL MONTE, CALIFORNIA, IS OPERATED TO SERVE PAINT MANUFACTURERS IN THE WEST.

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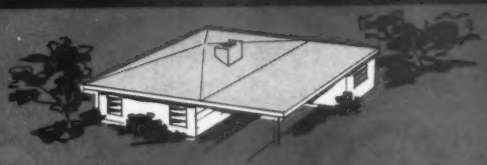

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(one of a series)

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A represents a PVAc base paint
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GELVA 2361 represents a Shawinigan PVAc paint formulation

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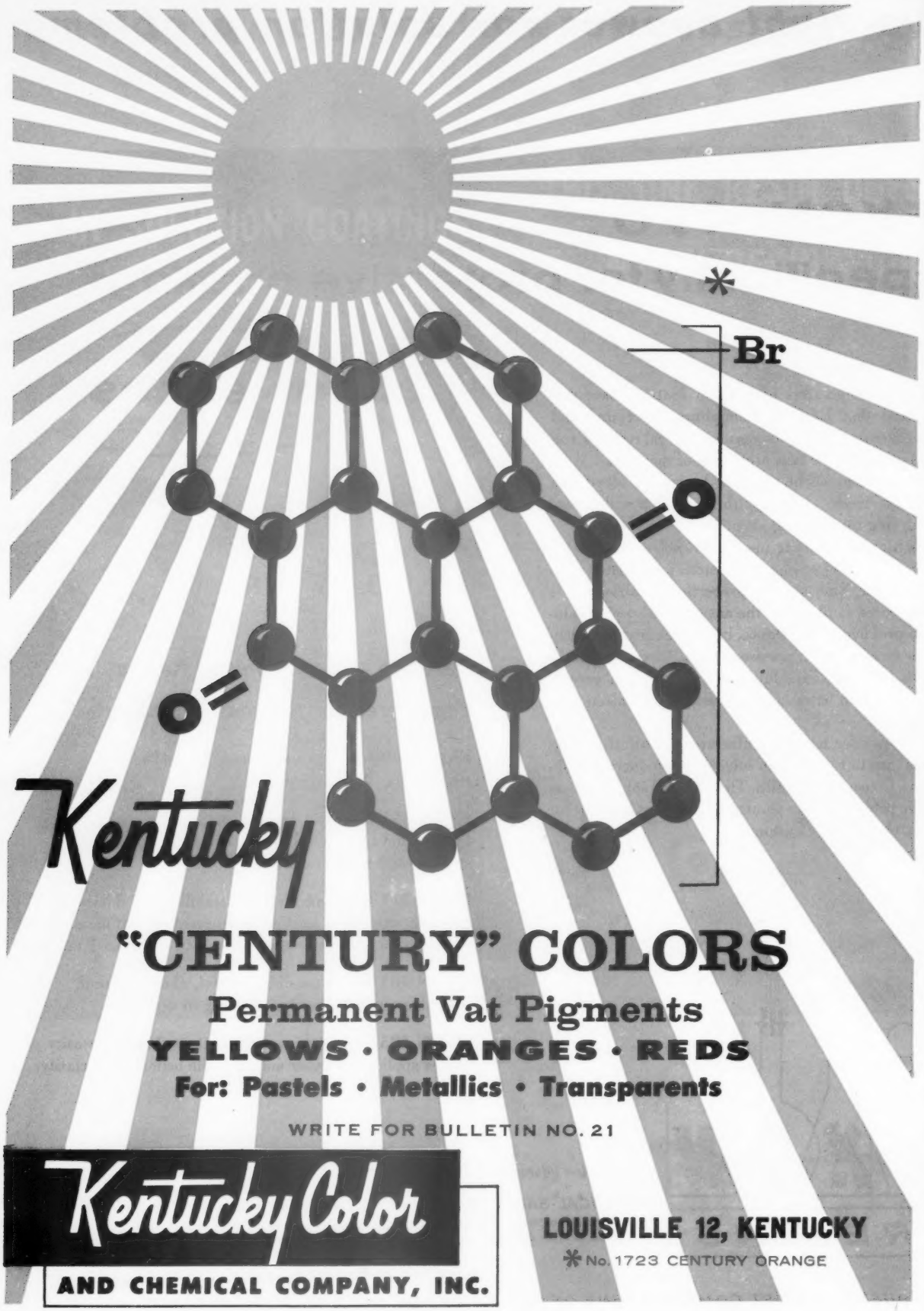
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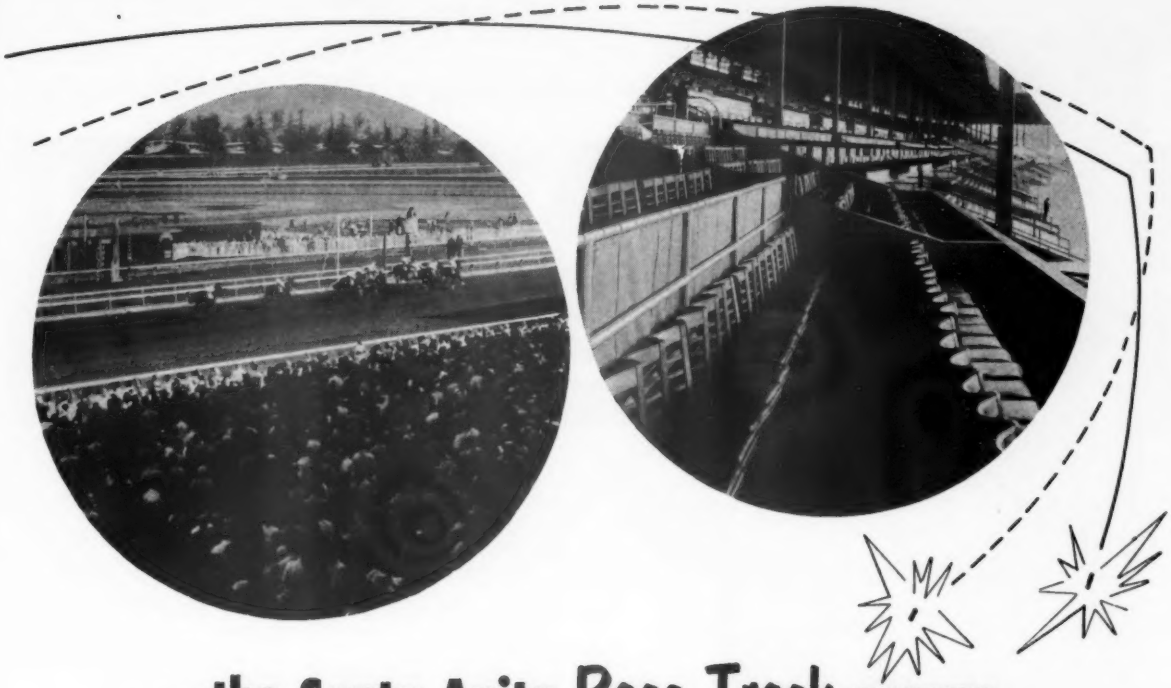

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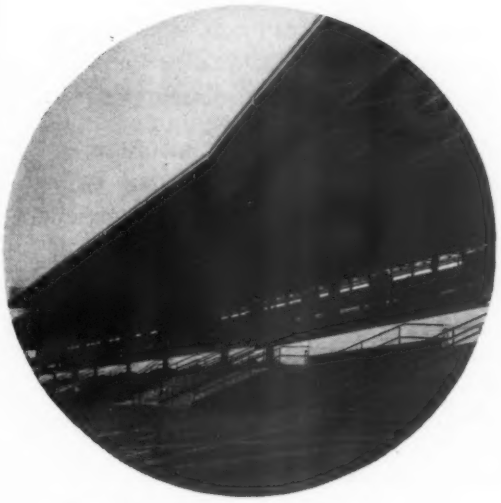

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"9200" Coatings used at Santa Anita Race Track furnished by Casey and Case Coating Company Los Angeles

Photographs by A. R. Hromatka

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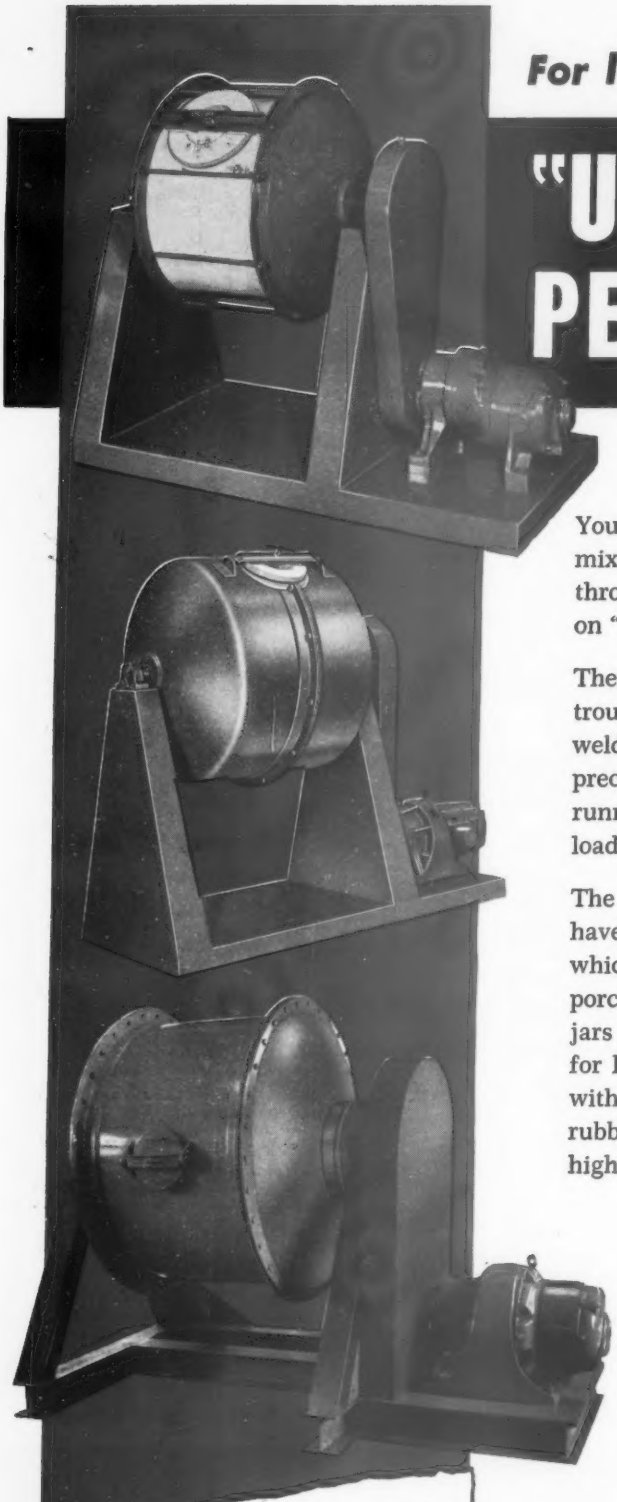

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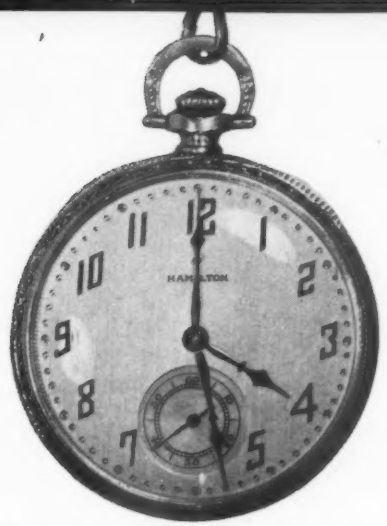

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Every day for 40 years the records have been taken at National Lead's Experimental Test Station, Sayville, L. I. . . . the weather, hour-by-hour . . . solar radiation . . . the chemistry of the air . . . the condition of thousands on thousands of paint samples. Today, on 2½ miles of test fence, more than 30,000 exposure tests are active.

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Sample No. _____ Weight of Paper and Paint _____ Volume Applied _____

Date May 10, 1957 Weight of Paper _____ Specific Gravity 1.255

Pigment Titanium Dioxide Weight of Paint _____ Hiding Power Sq. Ft. Per Lb. _____

Paint Gloss Emulsion Color _____ Weight of Paint Per Gallon 10.45 lbs. Hiding Power Sq. Ft. Per Gallon _____

Pigment Hiding Power = 434 / (Grams paint on chart X proportion of pigment in weighed film) = Hiding Power in sq. ft. per lb.

Paint Hiding Power = Weight of paint per gallon / Weight of paint applied = Hiding Power in sq. ft. per gal.

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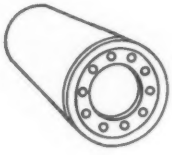

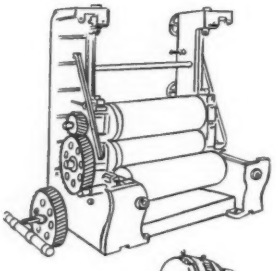

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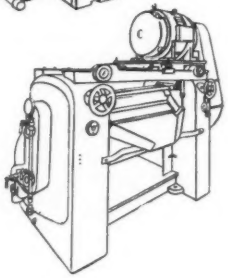
or replaced.



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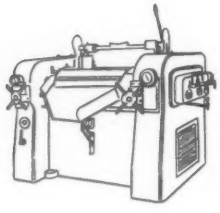

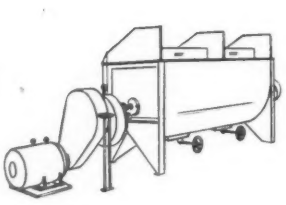

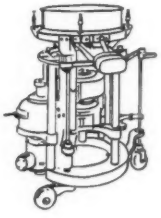

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BEHAVIOR OF PAINT SYSTEMS UNDER ULTRAVIOLET RADIATION

Study includes solution coatings, water emulsion coatings, and modified water emulsion coatings

By
Dr. Max Kronstein
College of Engineering
New York University

THIS paper is concerned with the behavior of a number of pigmented paint systems when exposed to ultraviolet radiation. In this study vehicle characteristics and pigmentation were investigated.

Based on the behavior of the systems under study, the paints were divided into three groups:

A. Paints based on film formers used in a state of solution.

B. Paints based on film formers used in a state of water emulsion.

C. Modifications of the vehicles used in "B" with alkyd resin solutions.

The vehicles used in Group A include alkyd resins (of the type used in flat alkyd paints), styrenated alkyds, and drying oil co-polymers with vinyltoluene-divinylbenzene. The vehicles used in Group B are styrene butadiene latex and polyvinyl acetate latices. That is, A comprises conditions where crosslinking and the formation of three-dimensional polymers occurs during the film-formation of the pigmented compounds; B refers to conditions where the pigmentation is taking place in water emulsions of already-polymer globular substance; and C applies to the pigmentation of water emulsions which contain the film-forming (not-yet-three-dimensional) material as well as globular emulsion polymers.

To avoid complications, of the study all formulations were prepared without special chemical ultraviolet absorbing additives.

This article is based on a paper presented at the Minneapolis Meeting of the American Chemical Society, Div. of Paint, Plastics and Printing Ink Chemistry.

For the same reason only white pigments were used, and no colored pigments were used which might undergo chemical changes under ultraviolet radiation. The white pigmentation consisted, in all cases, of

1. A high hiding pigment; that is, a pigment of very low transmission to light, rutile titanium dioxide.
2. Varying amounts of extender pigments; that is, pigments of low hiding power or of high radiation transmission.

By varying the ratio between these two groups, it was possible to produce for a given vehicle pigmentation varying degrees of ultraviolet transmission; and, in this manner, to study the effect of such variations on the film itself. It was possible to compare also how a given ratio of hiding and non-hiding pigments affect pigmented films of various vehicles. Each paint group was prepared, using a base formulation recommended for the particular vehicle as paint binder; and in these formulations conditions were selected which would point up the behavior of such systems under ultraviolet light exposure.

In the course of the investigation some variations were also made between different hiding pigments and non-hiding pigments, so that the study would not be limited to one specific hiding or non-hiding pigment.

To check on the influence of the amount of non-hiding pigment in the exposure systems, some paints which had an extreme degree of non-hiding pigmentation were included, as shown in Table I-C. The purpose of this investigation is to show the effect of pigmentation in the film formation of various vehicles.

PAINTS BASED ON FILM FORMERS USED IN SOLUTION
(FLAT ALKYD PAINTS)

A. Paint Formulation:

Grinding Charge (Roller Mill)

Hiding Pigment:

Titanium Dioxide, Rutile - - - - - - - - - - - - - - - 99.0 grams

Calcium Extended Rutile Titanium Dioxide - - - - 99.0

Non Hiding Extenders:

Diatomaceous Silica - - - - - - - - - - - - - - - - 19.0

Medium Oil Calcium Carbonate and/or Wet Ground Mica - Varying according to 1-C. 160-mesh or 325-mesh

Zinc Stearate - - - - - - - - - - - - - - - - - - - 2.0

Vehicle:

Alkyd Resin, 30% Solids, Flat Soybean Type, Medium to Long Oil, with Low Odor Mineral Spirits - - - - - - - 204.0

Zinc Napthenate, 8% - - - - - - - - - - - - - - - - 3.6

Additions to the grinding paste:

Alkyd Resin, 30% Solids, as above - - - - - - - - - - 163.5

High Flash Mineral Spirits - - - - - - - - - - - - - - 69 3

Cobalt Naphthenate, 6% - - - - - - - - - - - - - 0.6

Lead Napthenate, 24% - - - - - - - - - - - - - - - 2.3

Anti-Skinning Agent (Coxine Type) - - - - - - - - - - 0.8

Wetting Agent, where indicated

Table 1-A

Comparison of Weight per Volume of Pigments:

	Weight	Volume
Titanium Dioxide, Rutile - - - - - - - - - -	10 grams	15 milliliters
Calcium Extended Rutile Titanium Dioxide	10 grams	14 milliliters
Calcium Carbonate - - - - - - - - - - - - -	10 grams	14 milliliters
Wet Ground Mica, 160 Mesh - - - - - - - -	10 grams	29 milliliters
Wet Ground Mica, 325 Mesh - - - - - - - -	10 grams	34.7 milliliters

Table 1-B

Extender Variations Used:

Sample	Calcium Carbonate		Wet Ground Mica	
A	337.0 g.	(100% Vol.)	0	g (0% Vol.)
B-1	126.6	75%	17.0	25%
B-2	126.6	75%	17.0	25%
C-1	84.3	50%	33.7	50%
C-2	84.3	50%	33.7	50%
D-1	42.2	25%	50.7	75%
D-2	42.2	25%	50.7	75%
E	0	0	67.4	100%

Table 1-C

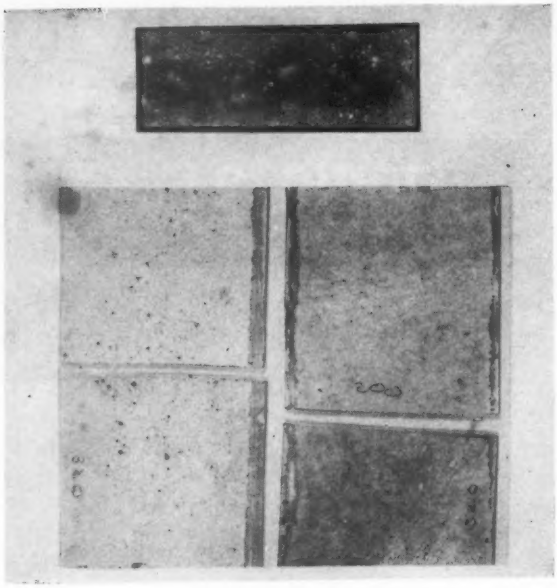

Figure 1. Ultraviolet exposure results of styrene-butadiene latex paints. Top: Paint film having 100% TiO_2 pigment composition. Below left: paint film with 100% TiO_2 pigmentation on white pine panel, showing effect of 200 hours of carbon arc exposure and 320 hours of quartz lamp exposure. Below right: Paint film with 90% TiO_2 and 10% mica, 325 mesh, on white pine panel. Effect of 200 hours of carbon arc exposure and 320 hours of quartz lamp exposure.

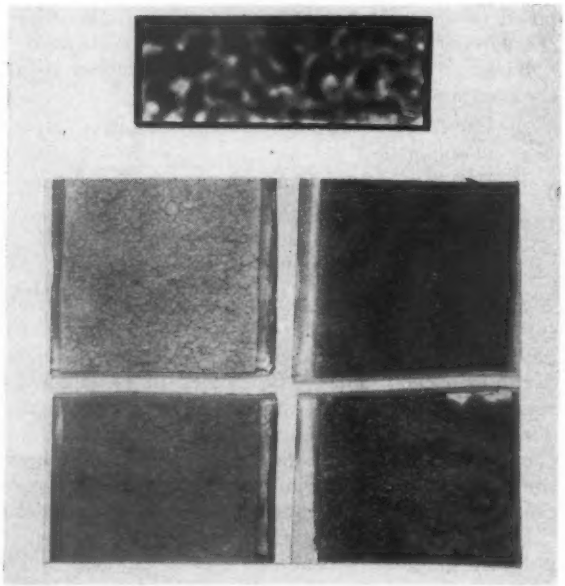

Figure 2. Ultraviolet exposure results of styrene-butadiene latex paints. Top: Paint film having 27% TiO_2 and 73% mica, 325 mesh, pigment composition. Below Left: Paint film with 27% TiO_2 and 73% mica, 325 mesh, on white pine panel, showing effect of 200 hours of quartz lamp exposure. Below right: Paint film with 100% mica pigmentation of white pine panel, showing effect of 200 hours carbon arc exposure and 320 hours of quartz lamp exposure.

Extender variation of each sample is given in Table I-C.

All paints were applied with a thickness of approximately 1.5 mil. When applied on wood, smooth, white pine panels without knots were used. Where tests on glass are indicated, window glass was used which were cut in panels to fit the frames of the Weather-Ometer.

As ultraviolet light sources, the twin carbon arcs of the Atlas Weather-Ometer were used. Even though this method caused temperature variation, it provided identical test set-up for all panels with regard to distance from the light source. Some control tests were made comparing the upper and lower portion of the panels in the Weather-Ometer frames. In some cases, a Hanovia Burner, Type SH, was used as ultraviolet light source. Here all tests used the same placement of the test panels in relation to the light source.

Under these conditions it was reasonable to assume that the effect of the ultraviolet light exposure on the white paint systems could be measured by determining the change in reflectance of the pigmented films before exposure and at time intervals during the exposure, and comparing the change in percentage of the initial value for the different groups. By measuring this reflectance with the Photovolt Reflection Meter, using a tri-green filter, the change could be expressed as percent change in whiteness. These data were the basis of comparison between various systems.

In spite of variations in the initial gloss of different paint systems, comparative measurements were made within each test group in testing the change in gloss (using as standard black Carrara glass.) Each measurement is the average of at least two panels. Where the results appeared especially interesting, most of the experiments were repeated, especially those shown in Figures 1, 2 and 3 of the paper.

The test paints consisted of (1) solution vehicles and (2) emulsion vehicles. because the mechanism of film formation is different for each system. Results indicated that this difference affects their behavior under ultraviolet exposure.

Solution Vehicles

Of the great number of different vehicles which are being used in a state of solution commercially, only a few could be selected for this study. A flat alkyd resin was selected to obtain coatings which are of the same order of initial reflectance as other film formers in this group. A styrenated alkyd was included in order to introduce a comparative vinyl group in some possible form, since the other test paints contained this group in some form or another. For the same reason drying oils copolymerized with vinyltoluene and with a divinyl-benzene were also studied.

To study the sensitivity of the resulting coatings to ultraviolet light, the vehicles were pigmented either with varying ratios of hiding and non-hiding pigments, or with a constant ratio of hiding and non-hiding material. Varying the particle size of the non-hiding pigment was also employed. For this reason, the ultraviolet light exposure results were studied for

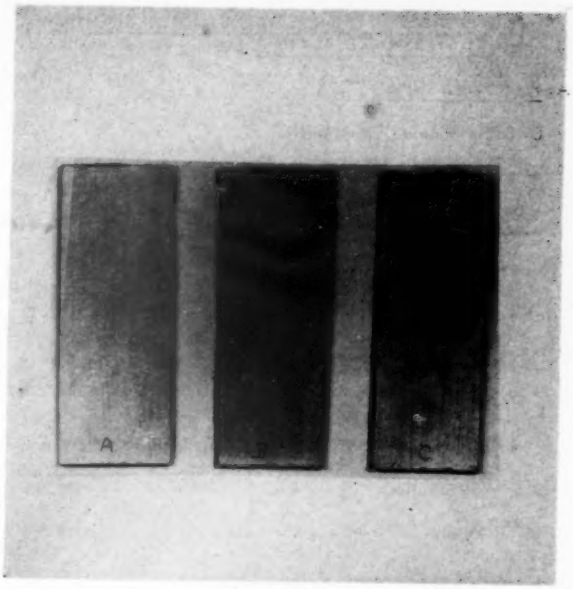

Figure 3. Ultraviolet exposure of polyvinyl acetate latex paints pigmented with 50% TiO_2 and 50% mica for 400 hours. A and B: Non-ionic unplasticized homopolymers; C: Preplasticized copolymer latex.

THE EFFECT OF ULTRAVIOLET LIGHT EXPOSURE ON THE REFLECTANCE AND GLOSS OF THE PIGMENTED FILMS OF TABLE I (Extender According to TABLE I-C)

PAINT DESIGNATION	REFLECTANCE VALUES USING TRI-GREEN FILTER EXPOSURE: 0 HRS.	100	200	250	400	PERCENT DIFFERENCE
A	77.6	78.2	79.8	-	77.0	-0.86%
**B-1	79.9	79.5	80.2	80.2	80.0	0.99%
-2	82.2	81.0	82.0	-	-	-0.24%
C-1	79.2	79.5	80.5	80.0	79.3	0.99%
-2	83.2	83.2	81.5	81.0	-	-2.64%
D-1	79.6	80.2	81.4	80.5	80.0	0.50%
-2	80.0	80.0	80.1	-	-	0.12%
E	78.8	79.8	81.3	79.3	79.8	1.23%

PAINT DESIGNATION	GLOSS COMPARED WITH BLACK CARRARA GLASS EXPOSURE: 0 HRS.	100	200	250	400
A	1.8	1.8	1.8	2.0	*
B-1	2.2	2.0	2.0	2.2	2.2
-2	2.2	2.4	2.4	-	-
C-1	1.8	1.8	1.8	2.2	2.2
-2	2.0	2.2	2.2	2.2	2.2
D-1	1.8	2.1	2.1	2.2	2.2
-2	2.0	2.1	2.1	-	-
E	2.2	2.2	2.2	2.2	2.2

*Cracks and chalking. No measurements made.
**Paint B-1 prepared with 5% soybean lecithin.
Paint B-2 prepared with 5% glyceryl mono-oleate.
NOTE: Nos. 1 and E, 160-mesh mica: Nos. 2, 325-mesh mica.

Table 2.

PAINTS BASED ON FILM FORMERS USED IN SOLUTION (WHITE STYRENATED ALKYDS)

A. Paint Formulation:

Grinding Charge (Pebble Mill)

Hiding Pigment:

Titanium Dioxide, Rutile - - - - - - - - - - - - 196.0 grams

Non Hiding Extenders:

Wet Ground Mica - 325 - mesh - - - - - - - - - 39. 0

Magnesium Silicate - - - - - - - - - - - - - - - 155. 5

Vehicle:

Styrenated Alkyd Copolymer, min. 22% Phthalic Anhyd,

(50% Solids) - - - - - - - - - - - - - - - - - 117.4

Xylol - 194.5

Milled to Fineness of Grind 5.

Additions to the Paste:

Higher Styrenated Alkyd Copolymer, 30% Phthalic Anhyd,

(60% Solids) - - - - - - - - - - - - - - - - - - 228. 7

Wetting Agent (Soybean Lecithin) Paint I: 0
Paint II: 3.9 grams
Paint III: 2.5 grams

Xylol -144.8

Cobalt Napthenate 6% - - - - - - - - - - - - - - - 0.56

Table 3-A

THE EFFECT OF ULTRAVIOLET LIGHT EXPOSURE ON THE REFLECTANCE AND GLOSS OF THE PIGMENTED FILMS. (Carbon Arcs and Intermittent Water Spray Used)

a Panels in upper positions of Weather-Ometer racks.
b Panels in lower positions.

PAINT DESIGNATION	REFLECTANCE(WHITENESS) USING TRI-GREEN FILTER EXPOSURE: 0 HRS.	50	100	168	PERCENT DIFFERENCE
I - a	86.5	86.5	86.0	85.2	-1.5
- b	86.5	86.5	86.0	85.2	-1.5
II - a	84.8	84.8	-	83.8	-1.2
- b	84.8	84.8	-	84.2	-0.7
III - a	86.5	86.5	86 0	86.0	-0.6
- b	86.5	86.5	86.0	86.0	-0.6

PAINT DESIGNATION	GLOSS (AGAINST BLACK CARRARA GLASS) EXPOSURE: 0 HRS.	50	100	168	PERCENT CHANGE AFTER: 50Hrs.	168 Hrs.
I - a	16.0	14.0	13.0	12.0	-12.5%	-25.0%
- b	16.0	14.0	13.0	12.0	-12.5%	-25.0
II - a	11.0	11.0	11.0	11.0	-0%	0%
- b	11.2	10.8	10.8	9.7	-3.5%	-13.4%
III - a	22.0	18.0	16.0	16.0	-18.0%	-27.0%
- b	22.0	20.0	16.0	16.0	9.0%	-27.0%

Table 3-B

PAINTS BASED ON FILM FORMERS USED IN SOLUTION (WHITE VINYLTOLUENE DIVINYLBENZENE DRYING OIL PAINTS)

. Composition:

A) Copolymerized Oil prepared from

Linseed Oil, bodied, Z-2 - - - - - - - - - - - 65 grams

Mineral Spirits - - - - - - - - - - - - 67.0

Heated to 155°C. in reflux set-up.

Mixture gradually added, consisting of:

Vinyltoluene - - - - - - - - - - - - - - - - - - 30.0

Divinylbenzene DVB-22 - - - - - - - - - - - - 5.0

t-Butyl Hydroperoxide - - - - - - - - - - - - - 1.0

Heated at 153-156°C. until viscosity Z was reached.

Diluted with Mineral Spirits - - - - - - - - - - - 8.5

Table 4-A

Paint Preparation:

Vinyltoluene Copolymer Oil - - - - - - - - - - - 76.00 grams

Titanium Dioxide, Rutile - - - - - - - - - - - - - 50.00

Extenders - - - - - - - - - - - - - - - - - - Varied According to (c)

Silicon Dioxide

Calcium Carbonate

Mica

Aluminum Stearate - - - - - - - - - - - - - - - - 0.50 g.

Soybean Lecithin - - - - - - - - - - - - - - - - - 0.75

Diluent (Mineral Spirits) - - - - - - - - - - - - - According to Paint.

Cobalt Naththenate 6% - - - - - - - - - - - - - 0.25

Calcium Napthhenate 4% - - - - - - - - - - - - 0.67

Anti-Skinning Agent - - - - - - - - - - - - - - 0.19

Table 4-B

Extender Variations Used:

PAINT DESIGNATION	OIL	DILUENT	SiO_2 (Grams)	EXTENDER $CaCO_3$ (Grams)	Mica (Grams)
I	Linseed	48.5 g	14.2	98.2	0
II	Linseed	60.6	-	87.5	25.0 (finer than 325-mesh)
III	Linseed	50.0	-	87.5	25.0 (325-mesh)
IV	Linseed	65.0	-	37.5	50.0 (finer than 325-mesh)
V	Linseed	80.0	-	12.5	75.0
VI	50% Linseed 50% Castor	48.5	-	12.5	75.0
VII	Castor	48.5	-	12.5	75.0

Table 4-C.

the same flat alkyd with the same amount of hiding pigment but varying the extender material between calcium carbonate and wet ground mica. Due to the wide difference in volume per given weight between calcium carbonate and mica, these components were varied by percent volume as indicated in Table 1. Variations were included in the particle size of the mica, using it either in 160-mesh size or 325-mesh size.

Table 2 shows that the reflectance values or whiteness changed very little in the exposure tests of these films; but in the surface condition a difference was observed in that Paint A, which contained only calcium carbonate as non-hiding material, cracked considerably with 400 hours exposure when none of the combinations of this extender with varying percents of mica had cracked. This might have been a result of a stronger seal against ultraviolet light obtained by the mixtures with the platy material in the total pigmentation, or it might be caused by the difference in volume-to-weight relation for the two materials.

It is to be mentioned that these exposure tests were made by using the Weather-Ometer arcs as ultraviolet light source without operating (even though this might have resulted in some degree of temperature rise) the water spray of the instrument at the same time. In cases where the water spray was used, all the test paints of the flat alkyd group showed cracks and blistered severely after about 100 hours' exposure.

In order to further test the sensitivity of these alkyd films to ultraviolet radiation, some of the specimens were tested with the addition of a glyceryl monooleate or of a soybean lecithin as wetting agent in an amount of 5% of the non-volatile solids in the flat alkyd. In this test group, a non-hiding extender was used in two particle sizes in order to detect if this difference in size would change the results in the series to any appreciable degree. This refers to Paint B in Table 2, where B-1 with 160-mesh mica was prepared with soybean lecithin and B-2 with 325-mesh mica was prepared with glyceryl mono-oleate. No measurable influence of the wetting agents on the reflectance values, or whiteness, was found in these tests within the applied 400 hour exposure. It was observed that in a number of specimens a slight increase in reflectance occurred at first, evidently due to the continued drying out of the films; but this was not maintained during further exposure because surface deterioration began to set in.

Comparing the test data with those following other test groups, it appears that in the tested variations the effect of the ultraviolet radiation on the films was very small, except on Paint film A where the early cracking might be due to other causes mentioned before.

In the two additional examples of solution vehicles, the test conditions were more severe. Twin carbon arcs of the Weather-Ometer were used with intermittent water spray of the instrument. The length of exposure was shorter, however, so that the results are still comparable.

The tests with styrenated alkyds were made with rutile titanium dioxide as hiding pigment and magnesium silicate and mica as extenders. Some specimens had a wetting agent in their formulation, in this case soybean lecithin. After 168 hours Weather-

THE EFFECT OF ULTRAVIOLET LIGHT EXPOSURE ON THE REFLECTANCE AND GLOSS OF THE PIGMENTED FILMS OF IV. (Carbon Arcs and Intermittent Water Spray Used)

PAINT DESIGNATION	REFLECTANCE (WHITENESS) USING TRI-GREEN FILTER EXPOSURE: 0 HRS.	100	125	225	PERCENT DIFFERENCE
I	85.0	79.5	-	72.9	-14.2%
II	78.0	71.1	-	68.6	-12.0
III	78.0	74.2	-	68.2	-12.6
IV	78.0	68.0	-	63.3	-18.9
V	76.0	67.1	-	62.0	-18.4
VI	73.5	-	70.0	-	- 4.7
VII	72.4	-	70.5	-	- 2.6

PAINT DESIGNATION	GLOSS (AGAINST BLACK CARRARA GLASS) EXPOSURE: 0 HRS.	100	125	225
I	1.8	2.4	-	2.3
II	1.8	2.1	-	2.2
III	1.9	2.3	-	2.4
IV	2.5	2.0	-	2.3
V	2.3	2.1	-	2.2
VI	2.1	-	2.5	-
VII	2.5	-	2.5	-

Table 5.

PAINTS BASED ON FILM FORMERS USED IN A STATE OF WATER EMULSION. (High Styrene Butadiene Latex Paints with Casein as Stabilizer)

a) Composition of the Test Paints:

Total Pigmentation ---------- 358.2 grams
(Hiding and non hiding pigments varied according to b)

Vehicle:

Lecithin, Water Dispersible ---------- 3.8

Distilled Water ---------- 190.0

Casein Solution ---------- 78.5

Foam Controlling Agent ---------- 3.5

Fungicide ---------- 37.0 Styrene Butadiene Latex 447.2

b) Pigment Variations:	Paint a	Paint c	Paint h	Paint l
Titanium Dioxide, Rutile	358.2 grams	251.0	179.1	57.3
Lithopone	0	71.5	0	-
Mica, 325-mesh	0	35.7	179.1	300.9

c) Ultraviolet Exposure Results: Reflectance (Measured with Tri-Green Filter)

PAINT	% Extender	0 HRS.	50	145	230	400	% Change
c	10%	83 3	71.6	69 0	66.6	71 0	-14.8%
h	50%	75.2	66.3	61.0	58 0	62.7	-16.6%
l	84%	66.2	57.5	49.5	46.8	50.3	-24 0%
		Gloss Readings (Against Carrara Glass)					
c	10%	9 5	5.5	3.5	2.3	2.3	-75 7
h	50%	5.5	3 0	2.3	2.0	2 0	-63.6
l	84%	6 3	3.8	2.3	2.0	2.0	-68.2

Table 6.

Ometer exposure, (Table 3) it was observed that the decrease in whiteness was of minor order, but that there was a considerable decrease in gloss, especially during the first 50 hours. This might be due to the greater effect of the ultra-violet radiation with the applied water spray, but the decrease in gloss was not combined with any considerable chemical change in the vehicle which would produce a decrease in whiteness.

When drying oils such as linseed oil, or dehydrated castor oil, were copolymerized with vinyltoluene and with a divinylbenzene (Table 4), the gloss increased; but the reflectance value, or whiteness, decreased considerably under ultraviolet radiation. The predominant color change under ultraviolet light occurred with paints employing copolymerized linseed oil as vehicles (Table 5). In spite of wide variations within the pigmentation, decreases in whiteness within a range of 12-19 percent after 225 hours exposure took place. Similar pigmentation for copolymerized dehydrated castor oil remained below this rate of decrease in whiteness.

Paints composed of solution-type vehicles showed uniform discoloration and gloss after exposed to ultraviolet. Local irregularities were not observed.

Emulsion Vehicles

It is generally assumed that in the case of latex emulsion paints the film is formed by a coalescence of the globular, tri-dimensional particles in the emulsion as they come closer and closer together during the evaporation of the water. In a pigmented emulsion this formation is more complex; and it is further complicated by the fact that these emulsion paints require a number of additives in their formulation, such as stabilizer, anti-fungus agent, anti-foaming agent and/or others.

The influence of these combinations on the behavior of the resulting paint under ultraviolet light exposure has been discussed before by this research group. (1) It has been shown that a styrene butadiene latex paint, when in a uniform state of emulsion, might result in a film which, in transparency, appears uniform and which, after ultraviolet light exposure, will show a similar form of discoloration as the paints based on solution vehicles. It has been shown that the degree of discoloration progresses more clearly with the changing ratio between hiding and not hiding pigments than was the case with the soluble vehicles. This is presented here in Table 6.

Similar results have been obtained, in the meantime, on paints based on polyvinyl acetate latices of different sources. These are shown in Table 7, but the earlier paper had shown also that the difference in the manner of film formation in water emulsion paints can result in local discoloration areas on the panel surface when such films are exposed to ultraviolet radiation.

Figures 1 and 2 show these developments on styrene butadiene latex pigmentations. They show that the effect of the ultraviolet light increases with the decreasing hiding power. The configurations which appear on the panels with increased transmission of the pigmentation are, in the opinion of this

PAINTS BASED ON FILM FORMERS USED IN A STATE OF WATER EMULSION (Polyvinylacetate Latex Paints)

a) Composition of the Test Paints:

Pigmentation

Type A: Titanium Dioxide ---------- 251.0 grams
Lithopone ---------- 71.5
Mica, 325-Mesh (10%) ---------- 35.7

Type B: Titanium Dioxide ---------- 179.1
Mica, 325-Mesh (50%) ---------- 179.1

Vehicle:

As in Table VI, but using

Latex A: Commercial non-ionic type homopolymer polyvinylacetate, not plasticized

Latex B: Same as A, but of different origin,

or Latex C: Preplasticized copolymer polyvinylacetate latex

b) Ultraviolet Exposure Results - Reflectance, Using Tri-Green Filter

PAINT	% EXTENDER	TYPE LATEX	0 HRS.	140	210	335	%Change
A	10%	Latex A	-	71.5	71.0	70.8	-0.9%
		Latex B	-	70.8	70.0	70.6	-0.3%
		Latex C	-	71.0	70.4	70.0	-1.4
B	50%	Latex A	76.0	71.0	70.8	70.2	-7.6
		Latex B	77.0	73.4	73.0	73.0	-5.2
		Latex C	74.2	64.8	64.2	60.4	-16.2

Table 7.

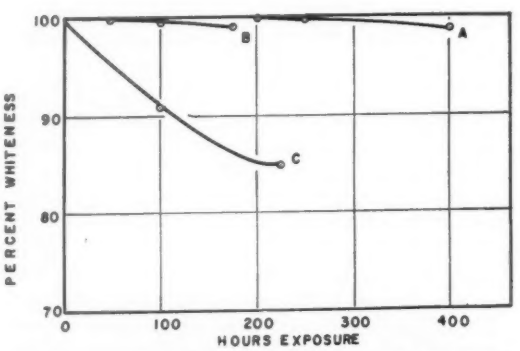

FIG. 4. DECREASE IN WHITENESS IN % OF THE INITIAL REFLECTANCE MEASURED WITH TRI-GREEN FILTER. AVERAGE VALUES FOR THREE TEST GROUPS USING VEHICLES BASED ON FILMFORMERS IN SOLUTION.

NO.	VEHICLE	PIGMENTATION HIDING PIGMENT	PIGMENTATION EXTENDER	AV. OF TEST SPECIMENS
A	ALKYD RESIN	37% by vol.	63% by vol.	7
B	STYRENATED ALKYD	50% by wt.	50% by vol.	6
C	VINYLTOLUENE-LYNSEED OIL	31% by wt.	69% by wt.	5

Figure 4.

author, caused by the effect of the ultraviolet radiation on the outside areas of the conglomerates in these paints. Their presence is shown in the transparency photos above each set of panels in Figures 1 and 2.

In the case of partial conglomeration, which is found in latex paints, this phenomena is quite frequently due to some of the additives used or due to some step in the paint preparation. Since it is possible that some of the available reactive groups in a styrene butadiene copolymer latex are not used up in the

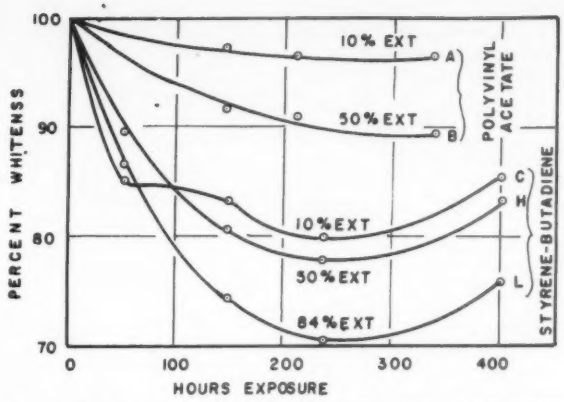

FIG.5. DECREASE IN WHITENESS IN % OF THE INITIAL REFLECTANCE MEASURED WITH TRI-GREEN FILTER. AVERAGE VALUES FOR TWO TEST GROUPS USING VEHICLES BASED ON LATEX-WATER EMULSIONS.

#	VEHICLE	PIGMENTATION TiO_2	PIGMENTATION EXTENDER	AVERAGE OF TEST SPECIMENS	
c	STYRENE-BUTADIENE	90%	10%	3	
h	STYRENE-BUTADIENE	50%	50%	3	QUARTZ
l	STYRENE-BUTADIENE	16%	84%	3	
A	POLYVINYLACETATE	90%	10%	3	CARBON
B	POLYVINYLACETATE	50%	50%	3	

Figure 5.

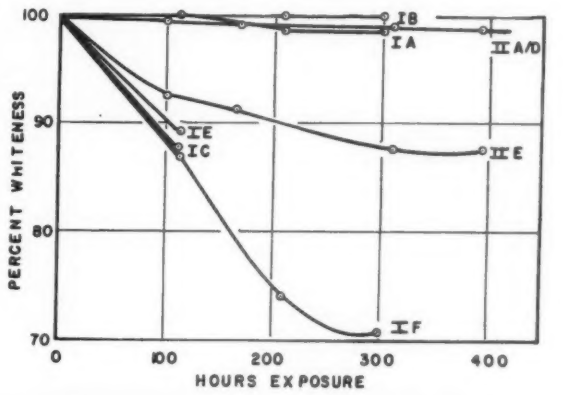

FIG.6. DECREASE IN WHITENESS IN % OF THE INITIAL REFLECTANCE MEASURED WITH TRI-GREEN FILTER. COMPARATIVE VALUES FOR EMULSIONS USING TWO DIFFERENT GROUPS OF LATICES AND VARYING RATIOS BETWEEN HIDING AND NOT HIDING PIGMENT

#	VEHICLE	PIGMENTATION HIDING PIGMENT % BY WEIGHT	PIGMENTATION EXTENDER MICA, 325#MESH	AV. OF TEST GROUP
IA	STYRENE-BUTADIENE LATEX-ALKYD EMULSION	100%	0%	1
IB	" " "	90%	10%	1
IC	" " "	70%	30%	1
IE	" " "	30%	70%	1
IF	" " "	0%	100%	1
IIA/D	POLYVINYLACETATE LATEX-ALKYD EMULSIONS	90%	10%	6
IIE	" "	50%	50%	2

Figure 6.

joining of the film the effects of the ultraviolet radiation are more predominant.

It was therefore of great interest to study if these configurations will also occur in the case of polyvinyl acetate latices when the transmittance of the pigmentation reaches a certain state. Polyvinyl acetate latices are generally assumed to be free of unsaturation or do not contain any available double bonds;

EFFECT OF CHANGING THE EXTENDER IN A GIVEN FORMULATION (POLYVINYLACETATE LATEX-ALKYD EMULSION PAINT)
HIDING PIGMENTATION: 70% (by weight) TITANIUM DIOXIDE, RUTILE.
20% (by weight) LITHOPONE
EXTENDER: 10% (by weight)

PAINT DESIGNATION	EXTENDER
A	MICA, 325-MESH, WET GROUND.
B	SILICON DIOXIDE.
C	ALUMINUM SILICATE.
D	HYDRATED ALUMINUM SILICATE.
E	MAGNESIUM SILICATE.

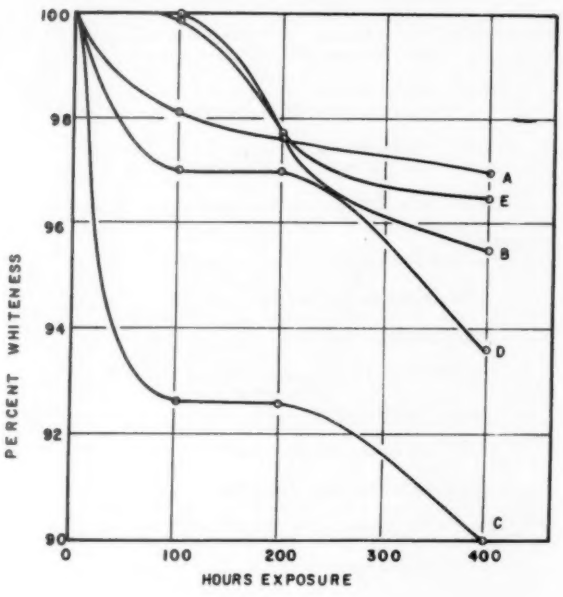

Figure 7.

(2) but the fact that these vinyl materials are being used in a tridimensional state as water emulsion polymer does not necessarily mean that all vinyl groups have been fully utilized in the polymerization or that all vinyl material is actually copolymerized.

The methods discussed in this paper seem to confirm this. The polyvinyl acetate latices used were indeed less affected by the ultraviolet exposure than the styrene butadiene latices, when pigmented with the same ratio of hiding pigments to transparent pigments. But Figure 3 shows that with a pigmentation consisting of 50% by weight of rutile titanium dioxide and 50% wet ground mica, 325-mesh, and after 400 hours exposure to the twin carbon arcs, three polyvinyl acetates from different sources show similar configuration areas as were earlier observed on styrene butadiene latices. The three latices used were two commercial, non-ionic type homopolymer, not preplasticized polyvinyl acetates, on Panels A and B, and a preplasticized copolymer type polyvinyl acetate latex on Panel C.

In comparing Figures 1 and 2 it is evident that in the case of the styrene-butadiene latex paints, the configurations appear with 90% hiding pigment and 10% non hiding extender, but they do not appear in the polyvinyl acetate latex paints before the hiding power has been lowered to 50% hiding pigment (rutile titanium dioxide) and 50% non hiding extender (325-mesh mica). This is an indication of the lower sen-

PAINTS BASED ON WATER EMULSION SYSTEM OF LATICES AND ALKYD (Styrene Butadiene Latex-Alkyd Paint)

COMPOSITION:

Pigmentation:

Paint A	Titanium Dioxide	313.6 grams
	Lithopone	70.5
Paint B	Titanium Dioxide	246.9
	Lithopone	70.5
	Mica, 325-mesh (10% of pigment)	35.3
Paint C	Titanium Dioxide	246.9
	Mica, 325-mesh (30% of pigment)	105.8
Paint D	Titanium Dioxide	176.35
	Mica, 325-mesh (50% of pigment)	176.35
Paint E	Titanium Dioxide	105.8
	Mica, 325-mesh (70% of pigment)	246.9
Paint F	Mica, 325-mesh (100% of pigment)	352.7

Vehicle:

Starch Solution (7.5%)	278.3
Sodium Hydroxide Solution (10%)	18.6
Wetting Agent	10.4
Long Oil Alkyd Resin, Soybean type (100% Solids)	104.4
Cobalt Naphthenate (6% Cobalt)	3.3
Lead Naphthenate (24% Lead)	8.4
Styrene-Butadiene Latex (48% Solids)	222.4
Anti-Foaming Agents	1.0
Anti-Skinning Agent	0.6

Table 8-A

EXPOSURE RESULTS: REFLECTANCE, USING TRI-GREEN FILTER
(After Twin Carbon Arc Exposure)

PAINT	%EXTENDER	0 HRS.	110	209	300	% CHANGE
A	0	84.8	85.0	83.6	83.6	-1.4%
B	10%	85.2	86.0	86.0	86.0	-
C	30%	73.0	64.0	-		-12.3%
D	50%	81.0	81.0	-	-	-
E	70%	82.0	73.0	-	-	-11.0%
F	100%	43.0	37.5	34.0	30.5	-29.0%

REFLECTANCE, USING TRI-GREEN FILTER (After Quartz Lamp Exposure)
(Comparison between styrene butadiene latex paint and styrene butadiene latex-alkyd paint)

PAINT	ALKYD	% EXTENDER	0 HRS.	230 HRS.	% CHANGE
a (TABLE VI)	No	10%	83.3	66.6	-20%
B	Yes	10%	83.0	75.3	-9.15%
C	Yes	30%	73.0	73.0	-
h (TABLE VI)	No	50%	75.2	58.0	-22.8%
D	Yes	50%	81.0	70.1	-13.7%
E	Yes	70%	82.0	67.0	-18.3%
I (TABLE VI)	no	84%	66.2	46.8	29.3%

Table 8-B

PAINTS BASED ON WATER EMULSION SYSTEM OF LATICES AND ALKYD (Polyvinylacetate Latex-Alkyd Paint)

COMPOSITION:

Pigmenation:

Rutile Titanium Dioxide	246.9 grams
Lithopone	70.5
Extender	35.3

Vehicle:

Starch Solution (7.5%)	278.3
Sodium Hydroxide Solution (10%)	18.6
Wetting Agent	10.4
Long Oil Alkyd Resin, Soybean Type (100% Solids)	104.0
Cobalt Naphthenate (6%)	3.3
Lead Naphthenate(24%)	8.4
Anti-Skinning Agent	0.6
Polyvinylacetate Latex A (homopolymer, non-ionic type, not plasticized -	222.4
Anti-Foaming Agent	1.0

Table 9-A

ULTRAVIOLET EXPOSURE RESULTS: REFLECTANCE (USING TRI-GREEN FILTER)

Extender Used	0 HRS.	100	200	400	% Change
Mica, 325-Mesh	87.1	85.4	85.2	84.4	-3.1%
Silicon Dioxide	86.0	86.8	84.8	82.9	-3.6%
Aluminum Silicate	87.0	80.5	80.5	78.3	-10.0
Hydrated Aluminum Silicate	83.0	80.5	80.5	77.8	-6.2
Magnesium Silicate	87.0	86.8	85.0	83.9	-3.5
Calcium Carbonate	83.0	89.0	86.8	86.2	3.7

COMPARATIVE EXPOSURE RESULTS USING DIFFERENT LATICES AND ADDITIVES (TWIN ARC EXPOSURES)

Latex	Alkyd	Mica	Wetting Agent	0 HRS.	100	170	310	390	500	%Change
D*	Yes	10%	None	70.0	70.0	69.7	68.9	68.3	68.3	-3.1
D*	Yes	10%	Mono-oleate	70.0	69.1	68.2	-	68.2	68.2	-2.57
D	Yes	10%	Lechithin	71.0	70.5	70.5	69.0	69.0	69.0	-2.8
A	Yes	10%	None	70.9	-	70.8	69.1	68.6	69.0	-2.7
A	Yes	10%	Mono-oleate	71.3	71.3	70.8	70.8	69.5	69.8	-2.1
A	Yes	10%	Lechithin	70.5	70.5	70.5	69.2	68.9	69.1	-2.0
B	None	10%	Mono-oleate	72.0	71.2	70.9	70.0	70.0	-	-2.8
B	None	10%	Lecithin	72.1	71.0	70.0	69.0	69.0	-	-4.3
C	None	10%	Lecithin	71.5	70.1	69.0	68.8	69.1	-	-3.3
B	None	50%	Lecithin	74.2	65.0	64.8	60.8	60.8	-	-18.3
C	None	50%	Lecithin	77.0	74.8	73.4	71.8	71.8	-	-6.7

*Latex D is similar to A but the approximate pH is 2 instead of 4.

Table 9-B

sitivity of the polyvinyl acetate latex system to the ultraviolet light.

The comparative degree of general discoloration on different pigmentations of polyvinyl acetate latex paints is shown in Figure 3.

(*Turn to page 106*)

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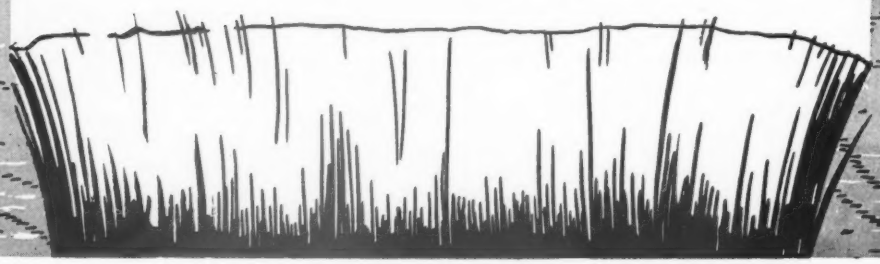

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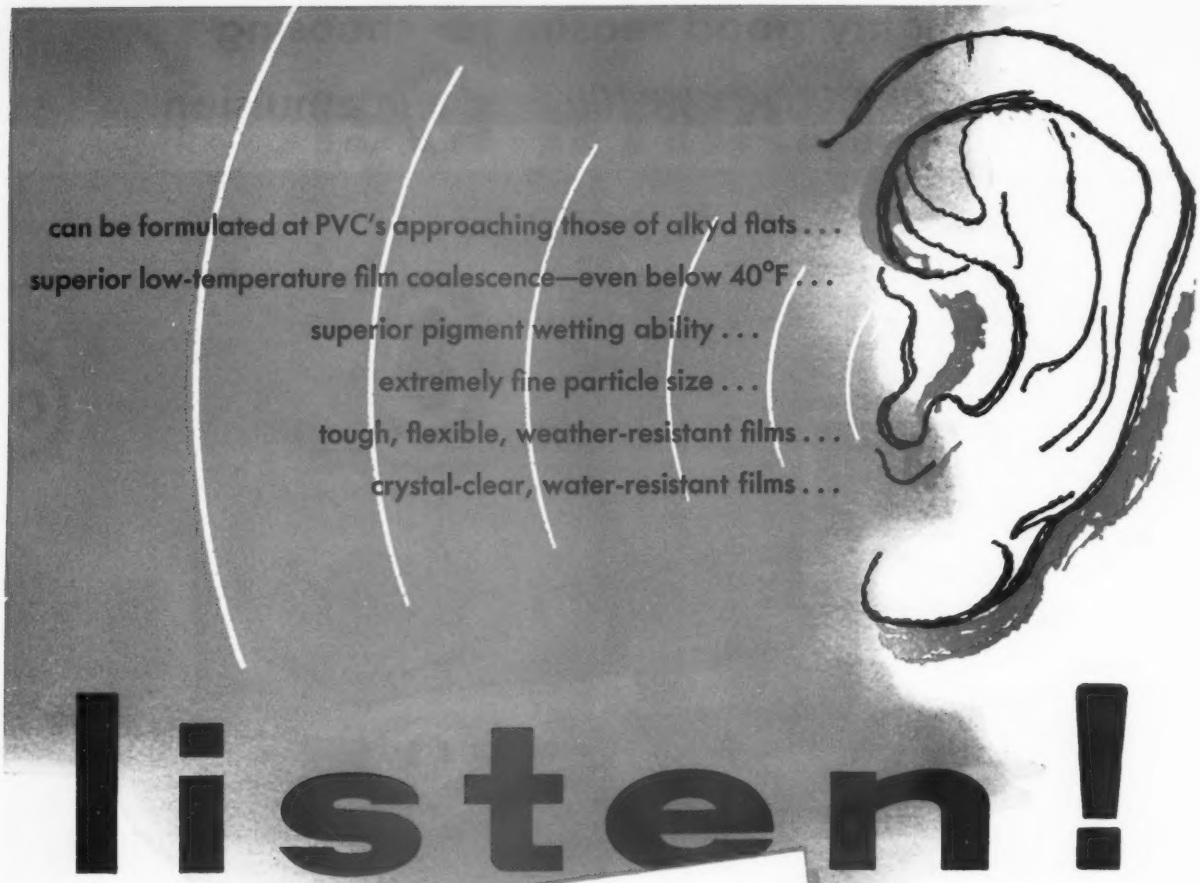

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OUTDOOR EXPOSURE of ACRYLIC EMULSION PAINTS

Part II — A Study of House Paint Test Jobs

By
Gerould Allyn

A NUMBER of laboratory controlled house paint test jobs and many commercial paint jobs have been studied in the test program on acrylic emulsion paints. These structures are located in many parts of the United States including New England, Florida and California. The great majority of these large scale applications of acrylic paints have been outstandingly successful and have provided protection and good looking paint jobs for intervals as long as four years.

We would like to review some of the findings based on these exposures and some of the unusual applications where acrylic paints are doing a good job.

Florida Exposures

Exposures in Florida have long been considered an accelerated test of paint durability due to the intense sunshine and rain fall prevailing in that area. In addition there is a large amount of masonry construction in that area so Florida has proved to be an ideal testing ground for acrylic emulsion paints. Panel exposures and large scale exposures have been followed closely in the areas. The results of some of the panel exposures have been given in Table II. (See Part I, May 1957 issue).

Exposures on buildings in Florida have given results quite parallel with panel exposures in the same area. White paints with relatively low chalking rates are used commercially. There is widespread use of both pastel and deep tone colors. Pastels are formulated with straight rutile non-chalking titanium dioxide for maximum chalk resistance.

Acrylic emulsion paints are not as susceptible to mold and mildew growth as oil paints because there is no vegetable base for the organisms to feed on. However both mildew and mold will grow on any dirt which might collect on the film. Furthermore, the surface painted may supply nutrients so that it is common practice to use rather large quantities of film preservatives, up to 1% in some cases, based on total paint.

One of the most spectacular developments in Florida has been the widespread acceptance of acrylic emulsion paints for both tile and asphalt roofs. This is a very severe exposure because the roofs become extremely hot on summer afternoons and then are frequently drenched by heavy rains. Many acrylic paint jobs on these roofs were completed as long as three years ago and excellent appearance has been maintained. Figure 1 shows a roof that was painted

Figure 1. Cement tile roof in Florida painted in May, 1954 with a coat of gray acrylic paint.

with one coat of acrylic paint in May, 1954. The acrylic paint was applied by brush over a solvent type paint that had failed in four months by severe blistering. The surface was prepared for painting by scraping off the old loose paint. After nearly three years exposure the roof is clean, in excellent condition and shows only mild chalking.

The roofing tiles for roofs of this sort are made from cement and sand. They are quite porous and have a rough absorbent surface with high alkali content.

Mr. Allyn is Associated with the Rohm & Haas Co., Philadelphia, Pa.

Figure 2. Asphalt roof painted in three colors. Two coats of acrylic paint applied in April, 1955.

Figure 3. One-coat acrylic painting of new construction. Paint was applied in February, 1955.

Figure 4. Acrylic paint applied during construction five to seven days after stucco.

They are often heavily discolored with mildew before painting. Attempts to paint these roofs with solvent based paints have been relatively unsuccessful in the past due to the porous surface which results in mottling and due to premature blistering.

For best results with acrylic emulsion paints the roof should be hosed free of dirt. If mildew is heavy it should be removed by steam or hot water jets. Painting can proceed as soon as the surplus water has drained off the roof. In all such applications it is desirable to hose the roof before painting so as to dampen the surface and supply some of the water needed to wet the porous tile.

Asphalt shingles and asphalt roll roofing as well as asphalt shingle siding have also been painted very successfully with acrylic emulsion paints. Pastel colored roofs or white roofs can thus be obtained. A striking example of this technique is shown in Figure 2. Asphalt roll roofing was laid on this roof and then an acrylic emulsion paint in three colors, pink, gray, and white was applied in April, 1955. The stucco walls were painted with the same pink paint. This roof, and the walls are in excellent condition with no evidence of fading, no dirt collection and no change in original appearance.

Light colored paints of this type reflect a large portion of the sunshine and therefore reduce indoor temperatures in hot climates. Since water is used as the thinner rather than a solvent, asphalt bleed-through has not been a problem

Acrylic emulsion paints, in a single coat, have been used very successfully by paint contractors for tract housing for both indoor and outdoor work. Outdoor durability has been good in two and three year exposures. It is essential of course for the contractor to apply enough paint to get complete hiding and adequate protection in a single coat. A typical Florida home is shown in Figure 3. This is one of a series of new homes painted with a single coat of acrylic paint in February, 1955. The color is apricot and when examined recently the paint job was in excellent condition.

There has also been wide spread use of acrylic paints in tract housing on fresh stucco. In one closely scheduled housing development the stucco is applied and allowed to set for five to seven days and is then painted with acrylic paint even though the walls may still be moist in spots. This is demonstrated graphically in Figure 4. As can be seen the stucco is being applied to homes in the foreground while the painters have already completed the exterior painting on the homes in the background even though they had only a few days to dry. The acrylic paint has enough moisture permability so that it does not blister and the films resist the alkali in the fresh stucco.

The fast drying properties of acrylic paints are being put to good use in the outdoor painting of signs and movie screens. In the sign illustrated in Figure 5 the painters were able to finish the entire sign, ground coat and three color coats in one afternoon. Each coat dried quickly and could be recoated in 15 minutes. Furthermore the colors have stayed bright and clean now for almost two years despite tropical exposure. Incidentally, the building itself was also painted with acrylic paint two years ago.

In a similar application contractors have found acrylic paints particularly useful for painting outdoor movie screens. The paints stay extremely white, have excellent adhesion to old painted surfaces, con-

crete or transite, and dry fast enough so that two coats can be applied in ones setting of the scaffold. Such a two application is shown in Figure 6. On this particular job a severe tropical rain and wind storm had occurred the evening before and yet painting could proceed without delay on the damp surface. Naturally, this gives worthwhile cost savings to paint contractors.

An unusual example of the toughness and adhesion of acrylic paints was found in an application in a Jai-Alai Fronton in Southern Florida. The walls of this court are painted with acrylic paint. As shown in Figure 7 the painted walls get quite a beating both from the players shoes and from the hard, baseball-sized ball used in this unusual game. The white spots are caused by rubbing off of the white goat-skin from which the ball is made. The acrylic paint used has withstood this severe treatment remarkably well and furthermore provides a flat, glare-free surface which is preferred by the players.

California Exposures

Some of the oldest paint jobs with acrylic paints are in the Southern California area with some commercial applications nearly four years old. These used the same acrylic vehicle which is available commercially today so that a long exposure history is available with this polymer.

Figure 8 shows one of these jobs. This was a new beach front club painted in two coats with light gray acrylic emulsion paint in May 1953. When examined recently the paint showed no chalking, no fading and no loss of adhesion or other film failure despite four years exposure.

Acrylic emulsion paints are being used very successfully over weathered oil paints. Adhesion to these weathered surfaces is very good although if there are areas which are glossy, the gloss should be removed by sanding or alkali treatment.

An outstanding example of such an exposure is given in Figure 9. This building in Southern California was painted in December, 1954. The surface prior to painting was described as "severely eroded oil paint, in some areas clear down to the bare cement". Two coats of acrylic paint in a pinkish buff were applied and have given excellent service. The building is located at the edge of salt water.

Considerable attention is given in California to the preparation of exterior masonry surfaces before painting. Early emulsion paints made with bases other than the acrylic type showed early and severe peeling and flaking when applied over previous coats of either oil or cement based paint. The problem was particularly troublesome when these early non-acrylic paints were applied over heavily chalked and eroded cement paints.

Consequently it has become the practice in California to sand blast such surfaces when possible or to apply a surface conditioner. Both treatments are quite effective and have made it practical to paint surfaces that might otherwise cause early failure.

The acrylic emulsion paints retain their flexibility on exposure so they have been less subject to failure than some other types of emulsion paints when applied over doubtful surfaces. It is still essential, however, to provide a good surface if a lasting and durable paint job is to be obtained.

The building shown in Figure 10 is an example of the excellent results which can be obtained using

Figure 5. Fast-drying acrylic paint permitted painting of motel sign in a single afternoon.

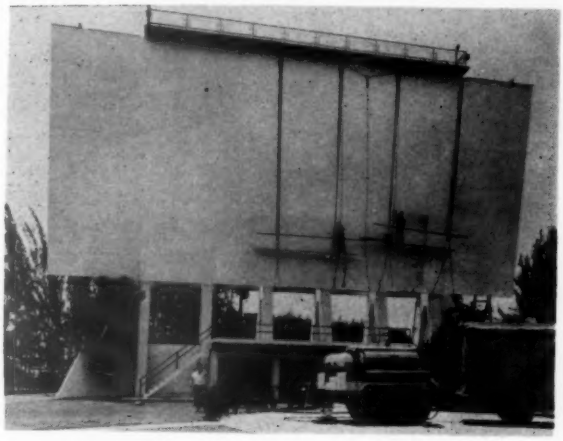

Figure 6. Painters apply two coats of acrylic paint in one scaffold setting to movie screen.

Figure 7. Acrylic-painted walls withstand punishment and are glare-free for Jai-Alai courts.

Figure 8. Acrylic paint on stucco is unharmed after nearly four years of beach-front exposure.

Figure 9. Building painted in December, 1954 with two coats of acrylic paint over eroded oil paint.

Figure 10. This acrylic paint job has not flaked or peeled after two years exposure in California.

an oil type surface conditioner. One coat of surface conditioner was applied by brush over a surface which was classified as "heavily eroded cement paint". This was followed by one brush coat of white acrylic paint and painting was done in January, 1954. On recent examination the paint showed no signs of peeling, or flaking, and only slight chalking.

Figure 11. Concrete block house in New Hampshire after acrylic paint job more than three years ago.

One of the most interesting new uses for acrylic emulsion paints is in the movie and television studios for indoor and outdoor sets. Painting can be done near heavy lights without the fire hazards associated with solvent type paints. Furthermore the slight odor of these paints means less irritation to the actors. As one glamorous actress put it recently "It isn't exactly Chanel No. 5, but working without heavy paint fumes is a pleasure."

Outdoors, the studios find that these paints give excellent durability on permanent sets. Since they dry quickly and brush easily, set changes are greatly simplified. Many studio buildings and sound stages in the movie lots of Hollywood are also acrylic painted for these reasons.

Mildew control is not as much of a problem in the dry climate of Southern California as it is in the Florida area but preservatives should still be included in formulations for that area. The trend in Southern California seems to be towards the use of straight non-chalking type pigment for both white and pastel formulations.

New England Exposures

Problems in New England and other Northern areas

Figure 12. Asbestos shingles in New Hampshire painted with a coat of acrylic paint in 1953.

are not too different from those encountered in other parts of the country except for the need for good resistance to low temperatures. Acrylic emulsion paints have withstood the rigors of three New England winters without cracking and peeling.

Adhesion to both old and new masonry surfaces has been good. Figure 11 shows a concrete block home in New Hampshire which was constructed and painted in August, 1953. The light blue-green paint shows no chalking and only slight color fading.

Asbestos shingled homes have also been painted very satisfactorily. Figure 12 shows an asbestos shingled home in New Hampshire which was painted in July ,1953. When examined recently there was found to be no chalking and the paint job was quite clean with the exception of some areas where roof drainage hits the walls.

Acrylic emulsion paints are being used very successfully as topcoats over a base coat of new cement paint on rough cinder block. The cement paint gives a uniform surface on the block and over the mortar joints. The acrylic emulsion paint can be applied as soon as the cement paint has become water resistant without fear of alkali attack. Such an application is shown in Figure 13.

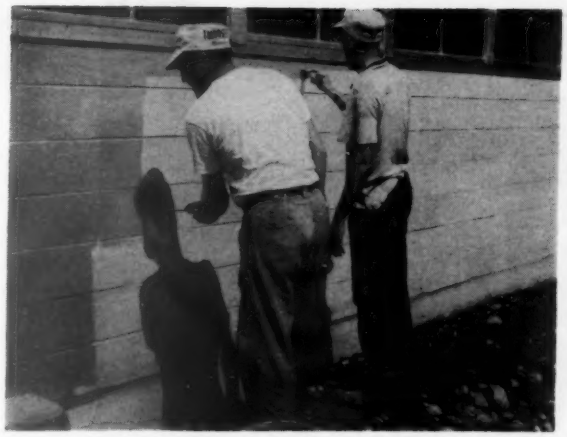

Figure 13. Painters apply acrylic emulsion top coat over cinder block coated with cement paint.

Suggestions for Exposure Studies

As indicated earlier, detailed exposure studies

(*Turn to page 108*)

Suggested Exterior Test Formulations[1]

Pounds per 100 Gallons

MATERIAL	Formulation 147-A high pigment volume masonry coating	Formulation 148-A low-cost masonry coating	Formulation 149-A highest quality wood and masonry coating	Formulation 150-A low chalking masonry coating for southern use
Add in order shown, mix in change can mixer				
Water	199.79	128.35	49.85	113.30
Anti-foaming agent	4.69	4.50	4.80	4.38
Triton X-102	0.45	0.44	0.36	0.41
Tamol 731 (25%)	2.96	2.89	2.40	2.74
Acrysol A-3 (25%)	7.12	6.93	5.76	6.57
Ammonium hydroxide (28%)	3.80	2.73	3.54	3.47
Rhoplex AC-33 (46%)	—	—	100.10	—
Methyl cellulose (2%)	—	69.00	—	—
Add slowly with thorough mixing				
Talc	39.48	31.40	97.30	23.50
Free chalking anatase titanium dioxide	50.00	50.00	50.00	25.00
Non-chalking rutile titanium dioxide	125.00	125.00	200.00	200.00
Calcium carbonate	336.65	267.00	—	200.00
Mix for twenty minutes, then grind one pass on roller mill. Add slowly				
Rhoplex AC-33 (46%)	425.00	361.00	564.00	483.00
Ethylene glycol[2]	15.0	15.0	15.0	15.0
Preservative	9.0	9.0	9.0	9.0
Water	—	96.00	—	79.00
	1281.94	1169.24	1102.11	1165.37
Physical Constants				
Total solids	61.3%	55.0%	60.0%	57.5%
Pigment	74.0%	74.0%	53.3%	67.0%
Binder	26.0%	26.0%	46.7%	33.0%
Pigment volume content	50.0%	50.0%	25.0%	40.0%
Ratio of rutile to anatase titanium dioxide	71.5:28.5	71.5:28.5	80:20	89:11
Approximate viscosity (Krebs Units)	65	65	65	65

1—If these formulations are to be used as tint bases, the titanium dioxide content should be 100% rutile non-chalking grade.
2—Mix thoroughly ethylene glycol and preservative before adding to paint.

Table I.

CELANESE MONOMERS

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Celanese now offers you a choice of three vinyl monomers for the development of better emulsion paints, adhesives, coatings, finishes, laminates, plastics and synthetic rubbers.

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Celanese Methyl Isopropenyl Ketone, a new vinyl monomer, forms tough plastics in homopolymerization, and copolymerizes with many commercially available vinyls for use in plastics, films, elastomers and adhesives.

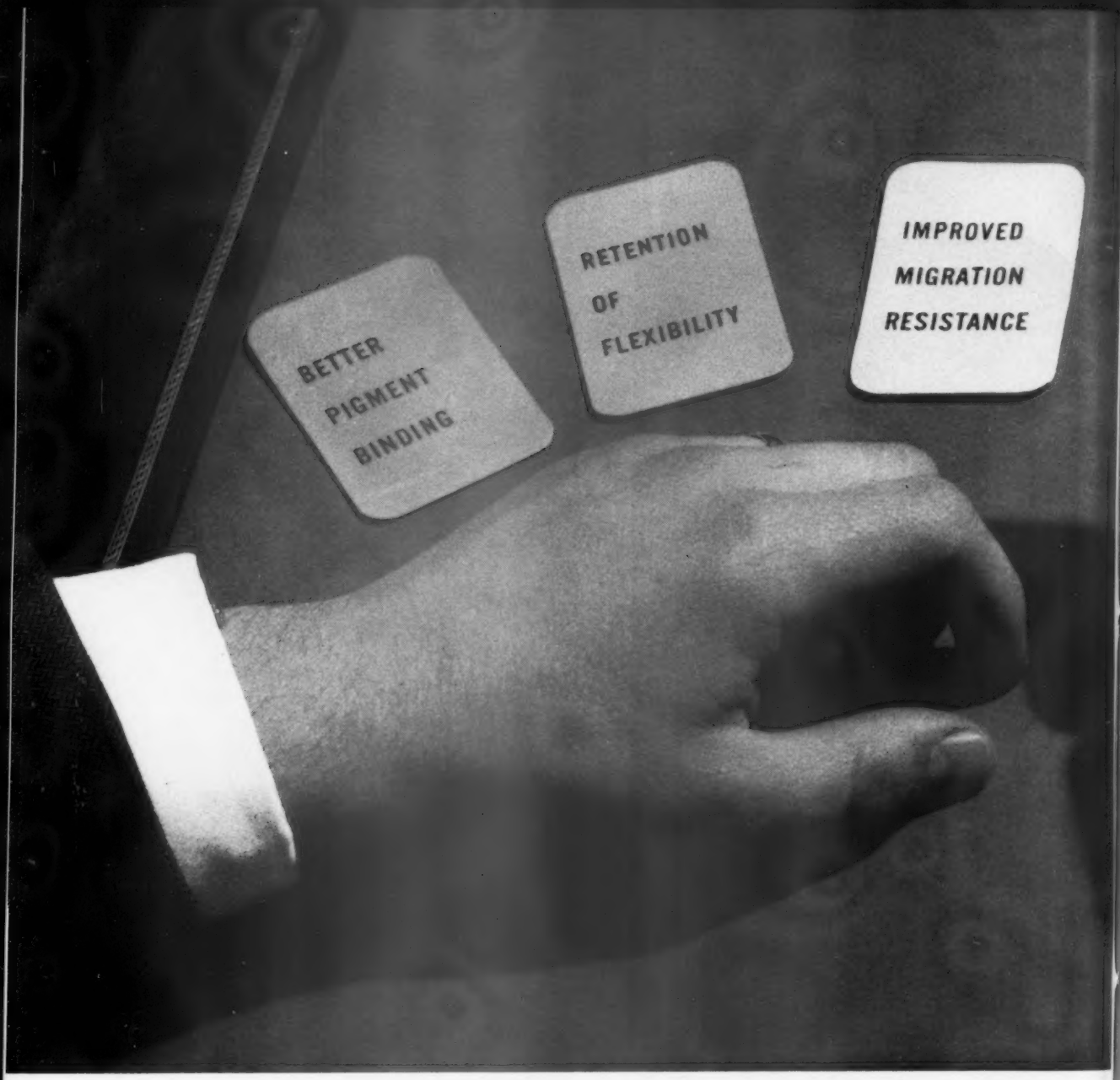
With the expansion of the Celanese development program to include **Acrylic Acid Esters,** Celanese will soon be in a position to offer you a broader range of monomers for your product development programs. Meanwhile, data accumulated by Celanese Research on Acrylic Acid Esters can be made available to you for use as the groundwork in your plans for the future. Also available from Celanese to help you in your planning are technical data sheets on Vinyl Acetate, Vinyl Propionate and Methyl Isopropenyl Ketone, specially prepared for your use by the Celanese Chemical Division.

Write: Celanese Corporation of America, Chemical Division, Dept. 558-F, 180 Madison Avenue, New York 16, N. Y.

Celanese®

	VINYL ACETATE	VINYL PROPIONATE	METHYL ISOPROPENYL KETONE
	Descriptive Data	Descriptive Data	Descriptive Data
Distillation Range @ 760 mm, °C	71.8-73.0	within 1° (including 94.9)	98 (true boiling point of pure product)
Color APHA, max.	5	10	water-white
Water, % wt., max.	0.15	0.15	1.5
Specific Gravity @ 20°/20°C	0.9330-0.9340	0.9170-9180	0.8555-0.8565
Acidity as acetic acid, % wt., max.	0.02	0.1	—

Celanese CHEMICALS



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2 will get you 7 when it comes a better,

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EMULSION STABILIZERS In oil-in-water emulsions, ALKATERGES and their soaps are effective as emulsion stabilizers or auxiliary emulsifying agents. They aid in the dispersion of insoluble calcium and magnesium soaps.

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PIGMENT-GRINDING ASSISTANTS; PIGMENT DISPERSANTS ALKATERGES convert stiff pigment-oil mixtures into fluid, easy-to-grind compositions. Also recommended in resin-carbon black formulations.

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DISPERSING AGENTS ALKATERGES are recommended as dispersants for flattening agents in varnishes and enamels and for any finely-divided solid in nonpolar liquids.

ACID ACCEPTORS Since most of their salts are somewhat oil soluble, ALKATERGES can be used to tie up acidity from deterioration of oils or additives. Useful also as perspiration acid neutralizers in corrosion-preventive oils.

ANTI-FOAMING AGENTS Used alone or in carriers, ALKATERGES control certain foams encountered in processing organic materials such as manufacturing antibiotics. They do not turn rancid and, in the concentration normally used, they are nontoxic to most antibiotic microorganisms. Tests indicate that Alkaterge-A is useful as an anti-foam agent in non-aqueous systems.

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CONSTANT SPEED DIPPING DEVICE

By
W. R. R. Park*
W. R. Dawson*

IN the course of some evaluation work it became necessary to reproducibly dip-coat a large number of test panels. None of the commercially available devices seemed suited to this purpose, so a simple instrument was devised to do the job. This instrument has worked so well that others engaged in dip-coatings evaluations may find it of value.

The instrument and dip tank are shown in Figure 1.

Essentially it consists of a small 1-rpm 110 V synchronous motor[1] and a hollow multiple aluminum pulley[2]. The motor is conveniently held in a 3-prong laboratory clamp and thus may be adjusted to any height and may be stored in a minimum space. In operation, the panel to be dipped is hooked to the pulley by a nylon monofilament[3] which is knotted and slipped through a small slot on the periphery of the desired size pulley.

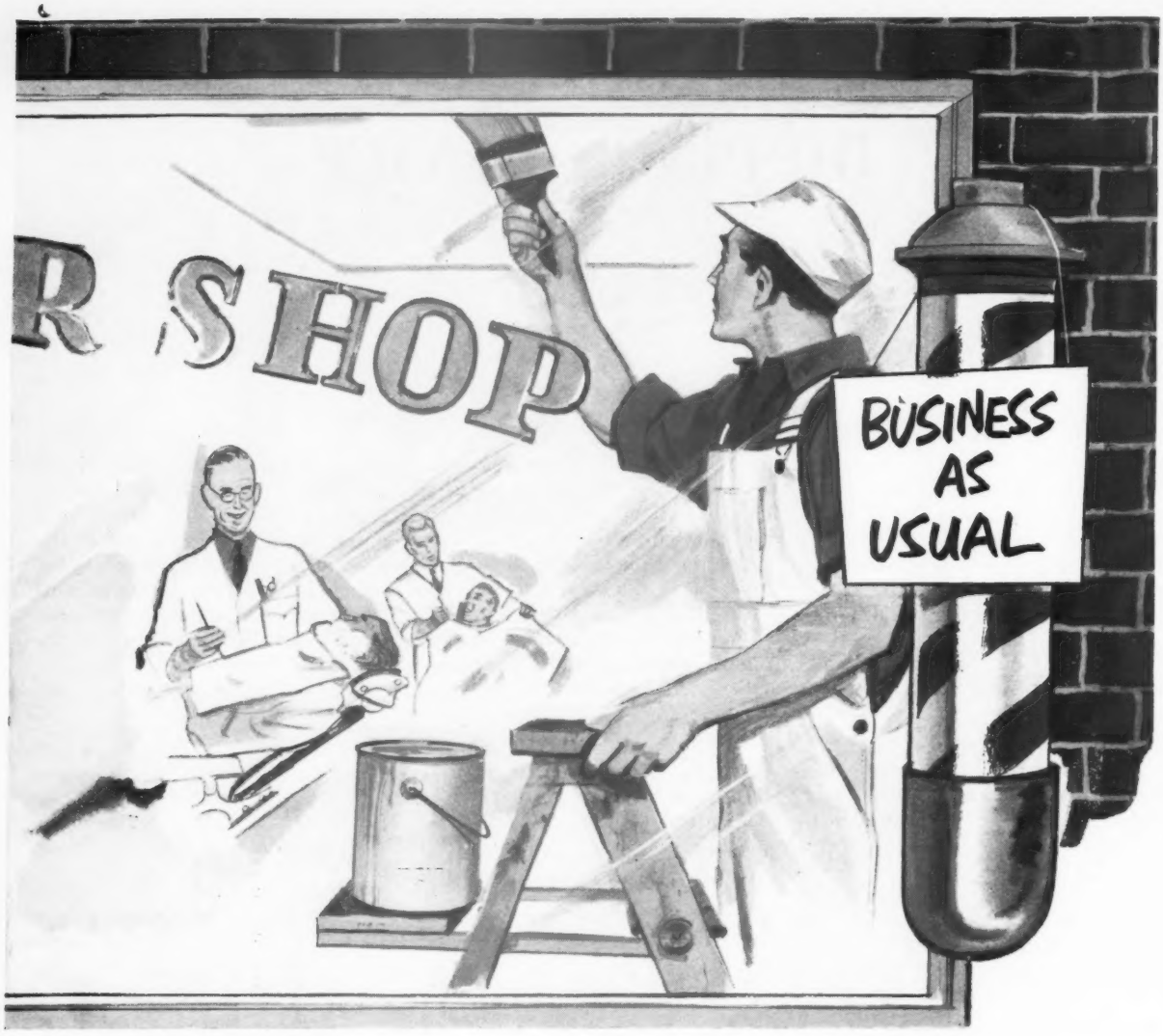
(*Turn to page 107*)

*Dept. of Chemistry and Chemical Engineering, Case Institute of Technology, Cleveland, Ohio.

System	1		2		3		4		5
Formulation Data	XYSG[a]	3.2	XYSG	3.2	P-97[c]	51.0	Epon 1007[e]	29.0	Sterling[h]
	BR-17620[b]	12.8	BR-17620	12.8	Butvar B-76[d]	2.7	R-108[f]	9.7	T-652-LB
	n-Butanol	84.0	n-Butanol	84.0	MIBK	35.5	SR-82[g]	0.6	Thermopoxy
					n-Butanol	10.8	H_3PO_4	0.7	
		100.0		100.0			MEK	28.0	
						100.0	Toluene	16.0	
							Ethanol	4.0	
							Xylene	6.0	
							Diacetone alcohol	6.0	
								100.0	
Non-Volatile	16.0%		16.0%		28.0%		39.0%		47.0%
Ford No. 4 Viscosity (seconds)	43		43		35		29		30
Dip Speed (in./min.)	10		10		7		5		3
No. of Coats	4		8		13		10		6
Intermediate Bake	10 minutes at 300°F		10 minutes at 300°F		20 minutes at 300°F		10 minutes at 300°F		15 minutes at 400°F
Final Bake	50 minutes at 325°F		20 minutes at 400°F		15 minutes at 400°F		90 minutes at 400°F		120 minutes at 400°F
Film thicknesses[i] from top to bottom of 4" x 12" panels on 2-inch sections (in mils)	1.6		3.8		4.0		5.5		4.4
	1.7		3.9		4.1		5.9		4.4
	1.8		4.0		4.2		5.9		4.4
	1.9		4.1		4.2		6.0		4.6
	1.9		4.1		4.3		6.0		4.7
	1.7		4.0		4.3		6.2		4.5

a Bakelite Vinyl Butyral
b Bakelite Phenolic
c Monsanto Phenolic
d Shawinigan Vinyl Butyral
e Shell Epoxy
f General Electric Phenolic
g General Electric Silicone
h Epoxy-Phenolic from Sterling Paint & Varnish Co.
i Each figure is average of three readings

Table I. Coating Data



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EHD 57-F

FIGHTING FIRE WITH KNOWLEDGE

In order to help the coatings industry "fight fire with knowledge," the Fire Technology Unit of the Southwest Research Institute has installed a flame spread tunnel for product evaluation and development.

The facility is the second of its kind in the United States. A similar unit is used by Underwriters' Laboratories, Inc., in Chicago for rating fire retardant paints and other interior finishes as to their burning characteristics.

The SwRI flame tunnel handles samples 25 feet long and 21 inches wide. A controlled flame is introduced at one end by two gas burners, while air is circulated at a constant velocity of 200 feet per minute. The air enters the tunnel at a temperature of 65-75 degrees F. and a relative humidity of 35-40 per cent.

The flame is carried approximately 4½ feet down the tunnel by the draft. Rate of flame spread is measured through 21 observation windows as the flame travels along the length of the test material.

Reference points for the tests are red oak flooring, which has a flame spread rating of 100, and asbestos cement board, which is rated at zero. Under standard test conditions it takes 5½ minutes for a flame to travel along 20 feet of red oak flooring. Ratings are based on the comparative flame spread times for materials under test.

Ratings based on the same reference points are also made for smoke density and fuel contribution. Smoke and gasses may also be analyzed and the degree of toxicity determined.

All standards for the tests conform with those of the American Society for Testing Materials and the National Fire Protection Assoc.

Warren Steihl (foreground) and Calvin H. Yuill, director of Fire Technology research at SwRI, remove the top of the Institute's flame tunnel.

According to Calvin H. Yuill, director of Fire Technology at SwRI, ordinary paints have a degree of resistance to flame spread. By special formulations, paints can be made to puff or intumesce on exposure to heat, thus providing an insulation at the surface.

Other paints are made to release smothering gasses, to fuse and form a hard protective coating over the undersurface, or to react with the undersurface in a manner which retards surface combustion.

Mr. Yuill pointed out, however, that acceptance of fire retardant paints has been held back because of inferior products that have not been thoroughly tested.

Small scale tests frequently used by manufacturers for demonstration purposes, he warned, are dramatic but, because they do not simulate all of the factors found in larger fires, lead to false conclusions.

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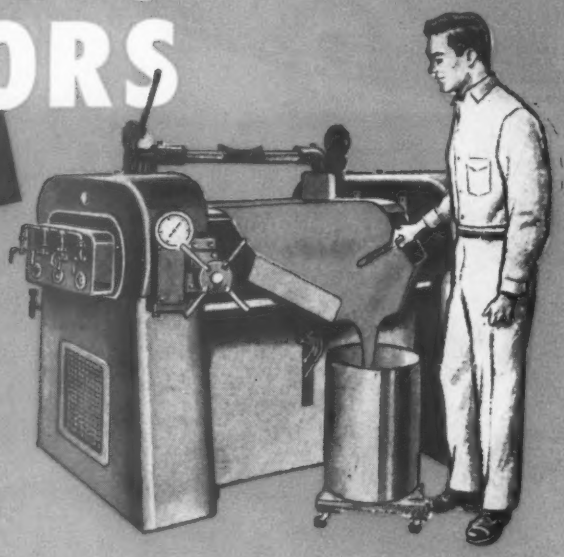

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NEWS

More Vigorous Promotion Suggested for Industry

Paint manufacturers have been advised by one executive to turn to Hollywood and the fashion world for new ideas in promotions.

William Ganick, vice president, Harold Cabot & Co., Inc., made the suggestion at a meeting of the New England Paint, Varnish & Lacquer Assoc. He said that the paint industry could make use of new product introductory promotion ideas successfully used by other industries.

As an example, Mr. Ganick said that film producers are eager to have their top stars help promote a new product in return for mention of their pictures in product advertising. The Hollywood idea could be expanded, he said, to include personal letters from the stars to dealers, and Hollywood visits as prizes for dealer contests.

Mr. Ganick also pointed to the use lipstick manufacturers make of color tie-ins with Paris fashion designers. Observing that it is a logical association because of the major importance of color, he said it also applied to the paint industry because 40 per cent of all interior painting is done by women alone or with their husbands.

Among other methods suggested were the use of premiums and coupons, sampling and store demonstrations. Mr. Ganick noted that premiums and mail coupons offering something "free" need not be expensive.

Mr. Ganick also strongly advised the more effective use of packaging from the standpoint of its sales appeal and the convenience of the customer. He said that packaging is advertising space, and cited its effective use by breakfast food manufacturers for advertising all sorts of offers and promotion ideas.

•

Cal Ink Building Laboratory

Ground has been broken for the California Ink Co.'s $250,000 laboratory in Berkely. The two-story building will be used for research and control.

Dr. Albert C. Zettlemoyer To Give Mattiello Lecture

Dr. Albert C. Zettlemoyer, professor of Chemistry and research director of the National Printing Ink Institute at Lehigh University, has been selected to present the Annual Joseph J. Mattiello Lecture at the 35th Annual Meeting of the Federation of Paint and Varnish Production Clubs, to be held October 30-November 2 at the Bellevue Stratford Hotel, Philadelphia, Pa.

Dr. A. C. Zettlemoyer

Dr. Zettlemoyer will speak on "The Pigment-Vehicle Interface." His talk will be the feature technical presentation of the Annual Meeting.

Research director of the National Printing Ink Research Institute since it was founded in 1946, Dr. Zettlemoyer has contributed considerably to advances in printing ink chemistry through his experience and studies in surface chemistry. During World War II he started a surface chemistry laboratory at Lehigh, with work on active magnesia catalysts for the synthetic rubber program.

Dr. Zettlemoyer graduated with honors in Chemical Engineering from Lehigh in 1936. He obtained an M.S. in Organic Chemistry there in 1938, and went on to receive a Ph.D. in Physical Chemistry at M.I.T. in 1940.

After instructing in Chemistry at M.I.T. in 1940-41, he joined the research division of the Armstrong Cork Co. as a research chemist. He soon returned to teaching, however, and became assistant professor at Lehigh in 1943, was promoted to associate professor in 1946, and became a full professor in 1950.

Dr. Zettlemoyer has published some seventy articles on the results of his work as a research director and teacher. He is the author of several chapters in books on rheology and surface chemistry, and presently holds five patents and six patent applications. He has travelled widely as a lecturer and teacher throughout the United States and in Japan and Europe.

Active in professional organizations, Dr. Zettlemoyer served as chairman of the Lehigh Valley Section, American Chemical Society in 1952-53. He was chairman of the Divisional Officers' Group, A.C.S., in 1953-54, chairman of the Division of Paint, Plastics and Printing Ink Chemistry, A.C.S., in 1954-55, and is presently chairman of the Division of Colloid Chemistry.

In addition, he was chairman of the Gordon Research Conference on Chemistry at Interfaces in 1955, and is now a member of the Advisory Board of the Gordon Conferences. He has held several posts in the American Society for Testing Materials and is a member of the Coating Committee of the Technical Association of the Pulp and Paper Industry. He is also a Fellow of the New York Academy of Science.

The Mattiello Lecture commemorates the name of Joseph J. Mattiello, Federation member who did much to expand the application of science in the protective coatings field. The committee which selected Dr. Zettlemoyer included W. E. Santoro (New York Club), chairman, C. A. Aloia (New York Club), H. P. Ball (Pittsburgh Club), H. E. Hillman (New York Club), and W. B. Pierce (New England Club).

The 1956 Mattiello Lecture was given by Maurice Van Loo of the Sherwin-Williams Co. on "Physical Chemistry of Paint Coatings."

NEWS

Automotive Finishes Topic of April Midland Meeting

Approximately 200 members and guests attended the April meeting of the Midland Coating Society in Midland, Mich., which featured talks on automotive finishes by Dr. Newell P. Beckwith, vice president and general manager of Rinshed-Mason Co. of Canada, Ltd., and Melvin Gerson of Ford Motor Co.

The technical program was prepared by A. L. Cipriano, chairman of the Midland group.

Dr. Beckwith spoke on exterior automotive finishes, while Mr. Gerson covered interior finishes. Both speakers were primarily concerned with future trends.

Interest in automotive finishes has been high since the automotive industry has shown response to such new developments as acrylics, water systems, epoxies and polyurethanes.

Dr. Beckwith predicted that in two years acrylic type lacquer and the new refrigerator type enamel will move in fast, and light and bright colors will continue to be popular. He said that in five years there will be a gradual merger of the two main types of automotive finishing systems into one metallo-organic or completely organic paint.

Dr. Beckwith went on to say that in ten years a major gain in water-based finishes is to be expected. Primers and sealers, he said, will be eliminated, and paint will make automobiles visible in the dark.

Mr. Gerson covered plastics and their uses in automotive interiors. He spoke of plastic upholstery and the practical problems which must be overcome, such as ease of cleaning. He also spoke on finishes used for such purposes as undercoatings for hoods.

A lively question and answer period followed the talks.

DISCUSS ZINC OXIDE: H. L. Young, vice president of American Zinc Sales Co. (left), and Maurice Van Loo, director of paint research, The Sherwin-Williams Co., discuss the importance of zinc oxide in paint formulations as part of a "user panel" discussion on "Zinc's Long Range Future." The panel discussion was part of the 38th annual American Zinc Institute meeting in Chicago.

Dow Plant Being Built

Construction of a second synthetic glycerine plant at Freeport, Texas, has been announced by the Texas Division of The Dow Chemical Co.

Completion of the plant is scheduled for March, 1958. The new unit is expected to double the firm's present glycerine capacity, according to Dr. A. P. Beutel, vice president and division general manager.

The new plant will use a Dow-developed process involving propylene and chlorine as starting materials. The firm has been producing glycerine at Freeport since June, 1955.

Facilities Expanded

Daniel Products Co. has acquired larger manufacturing facilities and offices in Jersey City, according to an announcement by Frederick K. Daniel, president.

The new plant consists of a two-story fireproof building, a one-story warehouse and several auxiliary buildings. The firm now has 15,000 square feet of manufacturing and warehouse space, and additional land for future expansion.

The firm produces the Tint-Ayd line of difficult-to-disperse tinting colors, the Flat-Ayd line of silica flatting bases and other specialty products for the paint industry.

GERMAN EXECUTIVES VISIT: A delegation of German paint and varnish firm executives made their first stop at the executive offices of Reichhold Chemicals, Inc., White Plains, N. Y. Herbert R. Helbig, RCI's vice president in charge of exports, shows ten of the delegation an automobile paint exhibit.

NEWS

Report Shows Sharp Rise In Construction Contracts

An 11 per cent gain in future construction contracts in the United States was recorded during March as compared to the same month a year ago, it was reported by the F. W. Dodge Corp., construction news and marketing specialists.

A total of $3,077,997,000 in future contracts, representing the largest percentage increase in recent months, was recorded. Included in the totals were two office building projects in Manhattan which together will cost more than $100 million, a $75 million pipeline development in Texas and a water supply project in California for nearly $50 million.

Dodge vice chairman Thomas S. Holden reported that, while strictly comparable figures are not available for the years before 1956, "there is no question that the March level of construction contract activity was an all-time March record."

The increase in total construction contracts came in spite of a decline in the residential catagory, the report continued. The March figure for residential contracts was $1,107,288,000, down seven per cent from the total for Mar. '56.

March contracts for non-residential building amounted to $1,092,441,000, up three per cent from last March, the report said. Manufacturing and public buildings were far below the year-ago level, but all other major non-residential types showed substantial increases. Contracts for hospitals were up more than 100 per cent in March.

The major factor in the rise in total construction contracts, however, was a 69 per cent increase in the heavy engineering category. The March total for heavy engineering contracts was $878,268,000.

Meanwhile, a steady acceleration of activity for the building trades in the southern states was predicted by Drew Schroeder, president of Pomona Tile Mfg. Co.

GRADUATES: Members of the Toledo Group of the National Paint, Varnish and Lacquer Assoc. who received graduate certificates after completing a paint power course held in the DeVilbiss Co.'s service laboratory. The course consisted of six weekly night sessions, and covered techniques of spray painting.

New Petrochemicals Plant

A $4 million petrochemicals plant for Delhi-Taylor Oil Corp.'s new chemical division will go on stream July 1, according to an announcement by Harry W. Dudley, general sales manager of the chemical division.

The new plant will be located in Corpus Christi, Tex. The Udex extraction unit will have a capacity of 45 million gallons per year. Initial production will include benzine, toluene and xylene, Mr. Dudley said.

New Heyden Newport Unit

Heyden Newport Chemical Corp. is constructing a new plant at Fords, N. J., according to Simon Askin, president.

The new unit will produce salicylaldehyde, an important intermediate in the manufacture of dyestuffs, odor bases and petroleum additives. The firm expects production to exceed one million pounds annually.

Completion of the new plant is scheduled for early in the first quarter of 1958, Mr. Askin said.

EXECUTIVE AWARD WINNEREdward: F. Paquette (right), vice president and general manager of the container division, Rheem Mfg. Co., plans the all-expense, four week trip to Europe he will make as recipient of the Bonelli Award for outstanding contributions to the firm. The award is presented annually to the outstanding executive and his wife by Francesco Bonelli, president of the Rheem affiliate in Italy. Mario Capelli (left), vice president in charge of Rheem International, assists with the plans.

NEWS

Diamond Alkali Initiates New Training Program

Diamond Alkali Co. has launched an intensive 18-month "engineering experience-technical training" program designed to broaden advancement opportunities for newly employed engineering graduates.

Thornton F. Holder, director of research, announced the program and said it should prove mutually helpful to the engineer and the company by developing maximum use of professional talents.

Mr. Holder announced the appointment of R. L. Annis, associate director of research, as program supervisor. Under the plan, each employee will work for six months in each of three participating groups in the firm's operating divisions. After 18 months the participant may chose to work permanently with one of the three groups with which he was previously associated, or continue in the program with a fourth group.

The program is expected to accomplish the following purposes:

1. Broaden the work experience background of a young engineer early in his career.
2. Facilitate intelligent choice by a young engineer of the type of work he wishes to do on a permanent basis.
3. Assist management in the selection of employees on a basis of work experience and considerable personal contact.
4. Promote better communications and broaden the opportunities of a young engineer for advancement.
5. Strengthen and improve the firm's recruiting efforts by making it possible for Diamond to offer to recent or prospective graduates positions which initially provide a variety of work experience.
6. Introduce junior engineers to management problems, techniques and responsibilities through working with divisional group supervisors.
7. Stimulate ingenuity and inventiveness through breadth of work experience.

THEY PAINTED THE TOWN: Representatives of the Portola, Calif., paint-up committee receive a $500 award from L. R. Brown, Sacramento branch manager of W. P. Fuller & Co. The award was won in community painting competition sponsored by Archer-Daniels-Midland Co. The Community Projects Division of W. P. Fuller assisted the committee with suggestions and organizational help.

Sales Down In February

Total sales for the paint, varnish and lacquer industry for February were $112,467,000, 10.3 per cent below sales for the previous month and 8.1 per cent below those of February, 1956, according to figures released by the Bureau of Census, U. S. Dept. of Commerce.

Total sales for the first two months of the year were $237,868,000, 5.5 per cent below those of the corresponding period a year ago.

Trade sales during February totaled $62,336,000, while industrial sales were $50,131,000 during the same time. Trade sales were down 12.9 per cent below those of the same month last year, but industrial sales dropped only 1.3 per cent.

Sales for the paint and varnish category of industrial sales were $36,865,000 in February, 8.9 per cent below those of January, and 1.0 per cent below those of the same month the year before.

Lacquer sales for February were $13,266,000, a drop of 5.8 per cent from January and 1.8 per cent below February, 1956.

Total gallonage reported was 42.3 million, with 87 per cent of the companies reporting sales data reporting gallonage also. Trade sales reported 23.8 million gallons, while industrial sales reported 18.5 million gallons for the month.

Pulp Chemicals Elections

Albert Scharwachter, vice president of Arizona Chemical Co., and R. J. Spitz, vice president of Newport Industries Co., were re-elected president and vice president respectively of the Pulp Chemicals Assoc. at its annual meeting in New York in March.

A. B. Doran of Union Bag-Camp Paper Corp. was elected chairman, and T. C. Clarkson of Crossett Chemical Co. vice-chairman of the Tall Oil Division of the Association for the current year.

Mr. Clarkson was also elected vice-chairman of the Sulphate Turpentine Division, with L. A. Radeker of Champion Paper and Fiber Co. re-elected chairman.

Dernell Every will continue as secretary-treasurer and T. K. Heston as assistant secretary-treasurer.

According to the Association, crude tall oil supplies reached a new high level of more than 300,000 tons in 1956.

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New Agents Appointed

Metalsalts Corp. has announced the appointment of two new agents to handle META-SAN, bactericide-fungicide for use in organic coatings.

Cordano Chemical Co., 56 S. E. Belmont, Portland 14, Ore., will handle sales in Oregon and Idaho, while Corl Chemical Co., 2603 Second Ave., Seattle 1, Wash., will cover Washington.

the ADM kaleidoscope

Published by
Archer-Daniels-Midland company
June-July, 1957

W. C. MUELLER
Sales Manager
Resin and Plastics Division

Too Many Resins "Spoiling Your Broth"?

Since World War II the paint industry has advanced in giant strides. New resins, new application techniques, new formulations that solve old, old problems have been the order of the day. And the benefits have extended to all segments of American life.

Yet, like so many advances in technology, this skyrocketing progress has brought its problems, too. With dozens of new products to work with and hundreds of old ones to modify, the Protective Coating industry now finds itself with literally thousands of paint vehicles and resins to choose from and the choice grows more difficult every day.

Looking back, it's easy to see how it happened. In its effort to develop new products, the paint industry encountered problems. The man whose gloss enamel lost its lustre demanded a non-hazing resin. He got it. But then he ran into slow dry . . . or sagging . . . or hard brushing . . . or—you name it!

The perfect, universal paint vehicle still doesn't exist and probably never will.

So, seeking always for improvement, the paint men became experts at compromise . . . "give a little—get a little". But that also led to problems. Too many modifications by too many people . . . and an almost unlimited list of resins resulted.

With over 200 resins and vehicles on its price list, ADM is very much concerned with this problem.

Now, we're aiming at a sharper focus—a realistic examination of the needs of the paint man and a realistic series of suggestions on how he can best fill these needs . . . in the simplest (and most profitable) way.

The next two pages present a *Resin Finder* for interior finishes. It's the first of a series.

Granted, you can always go "up a bubble" or "down a bubble" in search of some ultimate goal. We've avoided these debatable "fringe benefits". This *Resin Finder* points to a minimum number of products which can be used, alone or in combination, to meet every paint manufacturing need (we're talking only interior finishes in this one).

We've tested them. Our good friends and customers have tested them. We're certain that, using only these vehicles, you could produce paints with every degree of quality or performance you need. And we urge you to compare them with the resins you are using.

Though few in number, these vehicles more than make up for it with their unusual versatility. We've listed the many end uses they lend themselves to in addition to interior finishes.

This versatility suggests one of the best ways many of our customers have found to reduce their manufacturing costs. By using only a few extremely versatile resins and vehicles from a single source (with nationwide manufacturing, warehousing and shipping facilities) they find they can combine shipments to gain the lowest possible freight rates and at the same time hold inventory and tied-up working capital to a rock-bottom minimum.

We know *you* can reduce your inventory and your purchasing problems by using this *Resin Finder*. It's on the next two pages . . .

ADM RESIN FINDER...

GLOSS FINISHES

	Special Features	Application	Gloss and Color Retention	Compatibility	Versatility
Aroplaz 1241	For the very best interior gloss enamels. Superlative dry, hardness and water resistance. Type TT-R-266.	Excellent leveling. In viscosity range most manufacturers prefer. Available in odorless or low odor mineral spirits.	Unsurpassed gloss and gloss retention. Excellent color and color retention.	Compatible with "Q" Linseed in all ratios. Compatible with most varnishes, hard resin solutions and other interior vehicles. Good performance with zinc oxide. (Aroplaz 1248 has excellent performance with zinc oxide.)	**Preferred for:** architectural enamels, overprint varnishes, shake paints, metal sign, silk screen, store fronts, barn paints. **Recommended for:** freight car, marine, railway equipment and trim and trellis paints, plus structural metal primers.
Aroplaz 1248	Non-hazing, especially when used with zinc oxide. Has no equal and few rivals in this respect. 11-13 hour through dry. A premium quality product.	Excellent leveling. Available in odorless or low odor mineral spirits.	Complete freedom from hazing. Excellent color and color retention.		**Preferred for:** architectural enamels, metal sign and store front paints. **Recommended for:** freight car, railway equipment, marine, and trim and trellis finishes, plus structural metal primers and silk screen paints.
Aroplaz 1249	Faster dry than 1248 with very slight sacrifice in non-hazing. A premium quality product.	Excellent leveling.	Only very slightly below Aroplaz 1248 in gloss retention. Excellent color and color retention.		
Aroplaz 1086	Higher viscosity permits production of lower vehicle non-volatile paints. Best dry in this group.	Gives the good brushing of a long oil alkyd but performs like a medium oil in viscosity, hardness and drying properties. With proper let down solvents, can also be sprayed, roller-coated or dipped.	Excellent gloss and color retention. Outstanding durability and resistance to chalking.	Compatible with "Q" Linseed in 10:10 ratio to resin solution —Melamine in ratio of 2.5:10 of resin solution. Poor compatibility with zinc oxide. Compatible with most varnishes, hard resin solutions and other interior vehicles.	**Preferred for:** architectural finishes, automotive refinishing, metal furniture finishes, general utility enamels, machinery finishes, overprint varnish, railway equipment, roller coating, metal sign, truck and bus finishes. **Recommended for:** automotive enamels, low temperature baking enamels, metal cabinet finishes, eggshell finishes, farm implement, freight car, gasoline pump, hardware finishes, hospital equipment, industrial metal primers, structural metal primers, porch and deck paints, toy enamels.

SEMI-GLOSS

Aroflat 3010	When used as sole vehicle in semi-gloss enamels gives maximum color retention, flexibility, and package stability. High solids aid in production of high vehicle non-volatile paints. Exceptional washability.	Outstanding brushing and other application properties.	Maximum color retention.	Infinite compatibility with mineral spirits. Compatible in all ratios with "Q" Linseed and medium and long oil alkyds. Good performance with zinc oxide.	**Preferred for:** eggshell and semi-gloss finishes. **Recommended for:** primer-sealers, undercoaters and flats.
Aroflat 3025, 3055, Admerol 400	Recommended in semi-gloss enamels when modified with long oil alkyds. Aroflat 3055 imparts best self-sealing properties. Admerol 400 gives best brushing.				
MASTER PAINTER SYSTEMS **Admerol 400, 900**	These two products, alone or modified, give a complete line of master painters' interior flat, semi-gloss and gloss enamels, which combine ease of application and economy with many other desirable properties. Admerol 900 makes semi-gloss and gloss finishes with unexcelled brushability. Used alone, Admerol 400 gives outstanding flats.				

R...for Interior Finishes

FLATS

	Special Features	Application	Color and Color Retention	Compatibility	Versatility
LOW VISCOSITY					
Aroflat 3025	Unexcelled shelf stability. Does not thin in tinting. Very slight consistency change over a wide temperature range.	Excellent brushing, even over porous surfaces, with good non-penetration. Excellent flexibility. Good leveling and lapping.	Excellent color and color retention.	Infinite compatibility with regular and odorless mineral spirits within practical ranges. Compatible in all ratios with medium and long oil alkyd, and "Q" Linseed. Good performance with zinc oxide.	**Preferred for:** wall primer-sealers, undercoaters, semi-gloss, eggshell and flat finishes.
Aroflat 3050	Similar properties to Aroflat 3025. More economical but color retention not equal to 3025.	Excellent brushing, leveling and good non-penetration. Recommended for spray, and roller application.	Excellent color and color retention. Suitable for whites and light tints.		
Dryfol B-50 B-70	Lowest cost recommendation for: TT-P-47A (flat) TT-P-51D (flat) TT-P-56B (primer) Unexcelled stability.	Good brushing.	Fair to good color retention. Suitable for whites and light tints.	Compatibilities same as Ardanco. Good with zinc oxide.	**Preferred for:** flats. **Recommended for:** primer-sealers, semi-gloss and gloss enamels and enamel undercoaters, barn paints, eggshell finishes, shingle stains.
HIGH VISCOSITY					
Aroflat 3055	An economical high-viscosity, non-penetrating vehicle. Best available for color uniformity in one-coat applications.	Very good brushing leveling and lapping. Outstanding non-penetration.	Excellent color and color retention.	Infinite compatibility with regular and odorless mineral spirits within practical ranges. Compatible in all ratios with medium and long oil alkyds, and "Q" Linseed.	**Preferred for:** one-coat flats, best self-sealing semi-glosses and primer-sealers.
Aroflat 3060	Designed for excellent one-coat application. Similar in features to Aroflat 3055 but offered in odorless form.	Very good brushing. Gives the ultimate in holdout over surfaces of varying porosity. 2-4 hour dry.	Excellent color and color retention.		Specifically designed to be used with odorless long oil alkyds such as Aroplax 1241 in making a complete line of high quality color retentive finishes ranging from flats to full glosses in odorless mineral spirits.
Aroflat 3020	Excellent one-coat application. Meets TT-P-30 in an unusually economical ADM formulation.	Excellent brushing. Good sag control with optimum flow properties.	Excellent color and color retention.	Infinite compatibility with regular and odorless mineral spirits within practical ranges. Compatible with "Q" Linseed and varnishes.	**Preferred for:** wall primer-sealers, undercoaters, semi-gloss, eggshell and flat finishes.
Admerol 400	Does not thin on tinting. Slight consistency change over a wide temperature range.	Outstanding brushability and other application properties.	Good color retention. Suitable for whites and light tints.		**Preferred for:** eggshell finishes and flats. **Recommended for:** architectural gloss and semi-gloss enamels. Use without modification for wall primers.
Ardanco V-160	A limed oil for lowest cost paint with very easy brushing. For high viscosity, low solids paints.	Outstanding brushability.	Fair to good color retention. Suitable for whites and light tints.	Infinite compatibility with regular and odorless mineral spirits. Compatible with long oil alkyd, "Q" Linseed and varnishes.	**Preferred for:** flats. **Recommended for:** primer-sealers and semi-gloss. When fortified with Var 70-M makes excellent stucco paint. Used as a brushing aid additive.
THIXO-TROPIC Arothix 4000	A "gelled alkyd" flat. Easily applied by brush or roller. No pigment settling, no stirring.	Excellent brushing and roller application. No roller "mist" or dripping.	Good color and color retention.	Infinite compatibility with regular and odorless mineral spirits. Compatible with "Q" Linseed, and most alkyds.	**Preferred for:** flats, primer-sealers and enamel under-coaters. **Recommended for:** as modifier in other vehicles for ease of application and non-settling.

WATER SYSTEM	Special Features	Application	Adhesion	Water Resistance	Versatility
Arolon 110	A new concept in water emulsion paint vehicles. Smallest particle size of any commercially available emulsion.	Exceptionally easy application over highly porous or sealed surfaces. Brushes, rollers, etc. easily cleaned in water.	Greater adhesion over glossy surfaces than any other commercially available water emulsion vehicle.	Greater water resistance than any other commercially available water emulsion vehicle.	**Preferred for:** interior flats, primers, semi-gloss and gloss finishes. Exterior tests to date are promising.

Many of you know Bill Gove. He's been on our Northwoods Paint Sales Workshop Program two years in a row and has been a featured speaker at many trade conventions.

In 1953 The National Sales Executives picked him "Salesman of the Year" and the St. Paul Advertising Club in 1954 named him "Sales Promotion Man of the Year."

Bill will present, via KALEIDOSCOPE, his "Easy to Buy From" series.

Bill's a pretty practical guy. He believes that if we become easier to live with—we just automatically become easier to buy from.

"Easy to buy from"

By Bill Gove

Yes, we're all of us salesmen. And I'm sure that all of us will agree that selling is the most exciting business in the world. It's exciting because selling is people working *with* people—people *helping* other people—people *caring* for other people. And unless a man is a hermit, that's where he goes—to other people—for his satisfactions and achievements.

Because there's one thing that almost all of us need more than anything else in the world and that's to be recognized by other people—to be respected and cared for by other people—to be *necessary* to other people—to know that other people feel that we are important.

But more to the point, *the person you're selling*—your customer—needs these things as much as you do. *He wants* to be recognized. *He wants* to be respected. *He wants* to be considered important.

How do we, as salesmen, get this feeling of importance across to him? Certainly not with fast talk, tricky techniques or cute gimmicks. We get it across through the use of a wonderful thing called "*Empathy.*"

Now to be truthful, when I first saw the word "empathy" I thought it was some complicated kind of psychological formula. But actually there's nothing complicated about it.

"Empathy" simply means the desire and the ability to *put yourself in the other fellow's shoes;* to be able to say to him, "I know how you feel—I know your feelings are important to you. And because I know how you feel, *I want to help you!*"

"Empathy" is not the same as *sympathy.* "Sympathy" says, "I *feel* like you do—I'm sorry for you—I *share* your anxiety—your grief—your aggravation." When we sympathize with somebody, many times our worry or concern makes that person feel worse. We can't *help* a person with sympathy.

But "empathy" says something more constructive. "Empathy" says, "I know how you feel. I'm not upset about your problem, but I do know how you feel and how I'd feel in the same circumstance. So I'd like to *help* you and maybe I *can* help you.

See the difference?

And most people want "empathy"—not sympathy.

When a customer says "your price is too high"—or—"I'll see you in 90 days"—or—"I'm satisfied with my present source of supply"—maybe what he's really saying is, "Mister, you're not thinking of *me*—*my* business—*my* problem." He doesn't express it in so many words—but maybe that's what he's thinking.

Empathy is a wonderful word. It doesn't come wrapped up in a neat package with instructions on how to use it. But whether you realize it or not, you're using empathy all the time. You use it with those you really *care* about—your family,—your friends—your associates. You use it—it gives you a good feeling—it produces results.

When we learn to feel empathy—learn to tune in on the other person's wants and needs—we have more fun, sell more stuff, make more money.

And what's wonderful about empathy is that it's *easy*—the *easiest, happiest,* most *rewarding* thing in the world.

Technically Speaking . . .

NEW GYMNASIUM FINISH AVAILABLE AS VACATION NEARS. Based on a blend of ADM copolymers, a new ADM gymnasium finish formula has the approval of the Maple Flooring Manufacturers Association. This means it has water alcohol and naphtha resistance, resists skinning, touch drys in ½ to 3 hours, dries hard in seven hours, is suitable for waxing and free from sediment. Maximum color is 13 Gardner. It is 40% minimum non-volatile, has a minimum Sward hardness of 16 and a maximum viscosity of C.

NINE MONTH TEST PROVES AROCHEM STABILITY. A nine month storage test demonstrates the excellent stability of ADM Arochem Alcohol Soluble Hard Resins. Cut 10, 25 and 50 per cent in proprietary alcohol and in a 9:1 mixture of alcohol and Toluene, five Arochem resins showed no evidence of cloudiness or precipitation. Two others passed the test with slight modification.

A UNIVERSAL FLOOR TILE CEMENT which provides unusual water resistance yet can be diluted with water is offered in a new ADM formulation. This cement eliminates the problems of swelling of rubber tile and bleeding and softening of asphalt tile. It prevents destruction of adhesion of linoleum to its asphalt felt backing.

BLOCKING-OUT ENAMEL FOR OUTDOOR SIGNS. Based on an adaptation of a formula in the ADM Stain and Blister Resistant Paint Technical Bulletin, this enamel at 31% PVC and 51% vehicle solids offers the ultimate in hiding power when used to obliterate sign boards in the process of revision.

MULTI-COLOR LACQUER FORMULAS. Four new interior formulas for multi-color lacquers are grouped in an ADM Technical Bulletin now available. ADM lacquer plasticizers cut in alcohol have demonstrated stability equal to 100% solids materials in multi-color lacquers made in accordance with these formulations.

LOW BAKE GRAY SCREEN ENAMEL. ADM formulation makes a low cost dipping enamel for aluminum screen. Cut with two parts mineral spirits, the paint is blown from the screen by air blast, after dipping, then baked nine minutes at 200°F. The screen may then be rolled for shipping.

LOW COST BLACK DRUM ENAMEL. Combining economy and high gloss, the ADM formulation offers rock-bottom cost in drum painting where flexibility, adhesion and solvent resistance are not of foremost importance.

Material mentioned in "Technically Speaking" is available from

Archer-Daniels-Midland

700 Investors Building, Minneapolis 2, Minnesota

OTHER ADM PRODUCTS: Linseed, Soybean and Marine Oils, Paint Vehicles, Synthetic and Natural Resins, Vinyl Plasticizers, Fatty Acids and Alcohols, Hydrogenated Glycerides, Sperm Oil, Foundry Binders, Industrial Cereals, Vegetable Proteins, Wheat Flour, Dehydrated Alfalfa, Livestock and Poultry Feeds.

ASBESTINE 325

64 YEARS of production have paid off for International Talc Co. and its customers. As the world's largest producer of magnesium silicate, International Talc Co. announces the availability of their newest member to the family. . . . Asbestine - 325

★

THIS NEW PRODUCT FEATURES

Good dispersion with minimum use of oil needed in grinding. . . . enables formulating at higher pigment volume concentrations. Thereby. . . .

REDUCING RAW MATERIAL COSTS

without affecting performance of storage characteristics.

PRODUCT OF

INTERNATIONAL TALC COMPANY, INC.

ESTABLISHED 1893

WORLD'S LARGEST PRODUCERS OF TALC — **90 WEST ST., NEW YORK, N. Y.**

Also available in other grades. . . .featuring these advantages

1. Available in low, medium and high oil absorption
2. Pure white — suitable for white or colored paints
3. Acicular structure affords good suspension
4. Mixes readily in all paint vehicles
5. Contributes to greater durability in exterior paints
6. Excellent flatting agent for flat or semigloss coatings
7. Uniformly low moisture content (less than .5% loss at 212°F.)
8. Bulking value 4.2 gallons per 100 lbs.
9. Packed in 50 lb. paper sacks for your convenience

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ASBESTINE 325

S. W. Tuttle, Vice-President

NEW MATERIALS & EQUIPMENT

A MONTHLY MARKET SURVEY

This section is intended to keep our readers informed of new materials and equipment. While every effort is made to include only reputable products, their presence here does not constitute an official endorsement.

WITT

DRUM DOLLY
Facilitates Drum Handling

Drum dolly, hot-dip galvanized for rust resistance, converts 55 gallon drums to mobile containers able to be used indoors and outdoors.

Product accomodates drums having O.D.s up to 25", and has capacity of 600 pounds. Fabricated of 1/8" x 2¼" strip steel, dolly has four stem-type ball bearing casters available with three-inch iron or rubber wheels. Off-the-floor support reduces corrosion and wear on drum bottoms.

The Witt Cornice Co., Dept. PVP, 2121 Winchell Ave., Cincinnati 14, Ohio.

PLASTIC SKIN COATING
Prevents Dermatitis

Now available is a skin protective coating consisting of plastic dispersed in gel form in a water base. Said to be useful to workers in paint compounding and manufacture where dermatitis is a hazard.

Plastic film barrier formed by evaporation of "Ply no. 9 Gel" is claimed to be impervious to epoxies, amines, styrenes, lacquers, thinners, paint removers, vegetable oils, petroleum derivatives and most organic solvents. Said to be attacked only by acetone and methyl and ethyl alcohols.

Skin coating is not penetrated by abrasive dust, glass fibers or fine powders. Product is said to be non-irritating, non-toxic, non-absorbing and non-drying to the skin, and may be freely applied to arms, neck and face as well as to hands. It is water soluble and not recommended against water-based irritants.

Milburn Co., Dept. PVP, 3246 E. Woodbridge, Detroit 7, Mich.

SUCTION FILTER ASSEMBLY
All Plastic for Long Life

A suction filter assembly made entirely of plastic has been developed, said to provide superior service life and reduced cost for operation under many corrosive conditions.

HAVEG

Glass or synthetic filter cloth operating over filter grid plates claimed to provide longer life than is possible with stainless steel, monel or other corrosion resistant materials. Prices also said to be competitive with stoneware and rubber lining.

Equipment may be used in services involving temperatures as high as 350°F., according to manufacturer. Available in wide range of designs and in different plastics for different corrosion resistant requirements.

Haveg Industries, Inc., Dept. PVP, 900 Greenbank Rd., Wilmington 8, Del.

EPOXY PLASTICIZERS
Provide Low Viscosity

Two epoxy plasticizers have been introduced, reported to impart outstanding low-temperature performance and color stability to polyvinyl chlorides and other polymers with reduced plasticizer loss due to volatility.

Plasticizers said to provide low viscosity and good viscosity stability for plastisols.

Products, named Celluflex 21 and Celluflex 23, are available from Celanese Corp. of America, Dept. PVP, 180 Madison Ave., New York 16, N. Y.

DANGER SIGNAL
Pinpoints Pipeline Openings

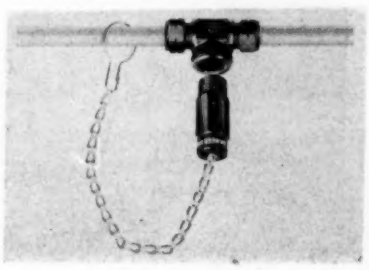
Free-hanging Danger Signal Bull Plugs pinpoint locations of dangerous openings in piping lines. Signals are easily seen and give immediate warning of unsafe conditions or fire hazards.

Painted with bright red bands, signals are attached to piping, and hang near openings to warn of danger. Also said to provide safe, positive and convenient method of gaining access to a threaded port of piping or valve.

Signals are easy to remove and replace because long shank provides a good grip. A long thread is provided to meet installation conditions normally encountered.

Available in steel and stainless steel in size range from ¼" pipe to 2" pipe from Crawford Fitting Co., Dept. PVP, 884 E. 140th St., Cleveland 10, Ohio.

CRAWFORD



A *Basic Step* to Better Alkyd Resin Finishes— Pittsburgh Phthalic Anhydride

Whenever you're ordering phthalic anhydride for alkyd resin finishes—or for any other product—it's good business to buy from a basic producer. For a basic producer can give you the purity, low color value and low maleic anhydride content that result from *complete* quality control. *And Pittsburgh is basic.*

In one completely integrated production cycle at our basic plant, we *Quality-Control* every step of phthalic anhydride manufacture from the selection of coal to shipment of finished P.A. to you. Can you think of a better assurance of uniform peak quality and dependable continuing supplies? ● Samples, technical literature and assistance are yours for the asking. Call or write us today.

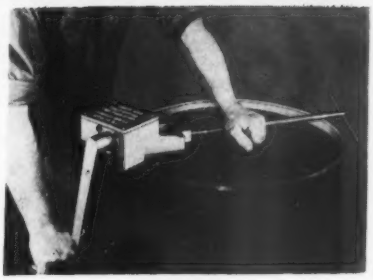
Available

in Flake in 80# bags and in Molten Form by Tank Car or Tank Truck

WSW 6488

COAL CHEMICALS • PROTECTIVE COATINGS • PLASTICIZERS • ACTIVATED CARBON • COKE • CEMENT • PIG IRON

NEW MATERIALS — EQUIPMENT



SCHINKER

DRUM HEAD CUTTER

No Saw Tooth Edges

Hand operated head cutter needing no electrical outlets or air connections has been developed.

Product promotes safety by eliminating damage to hands from rough edges, agitation of poisonous dust or fumes which occur with pounding, and danger from sparks or flames when cutting torch is used.

Sealed gear case and worm gear assembly, adjusting track cast in hard, sparkproof bronze, and ample bearing capacity for hard service are all features. Michael A. Schinker Mfg. Co., Dept. PVP, 6514 S. Western Ave., Chicago 36, Ill.

STAPLING MACHINE

Air Operated

Model BSA-Triplex air operated bottom stapler sets up carton bottoms using industrial size staples.

Machine drives three staples simultaneously on initial stroke, sealing end of carton. On the next stroke the two outer heads are inactivated by means of a mechanical trip. Center head then drives staple across center seam. Box is turned around and process repeated for other end.

Manufacturer says machine drives 600 staples per minute or more, depending upon experience of operator. Frame manufactured of hollow steel tubing for sturdy, light weight construction. Nonmovable anvils are of wear-resistant steel. Wearing surfaces are hard chrome plated.

Container Stapling Corp., Dept. PVP, 308 N. Park Ave., P.O. Box 247, Herrin, Ill.

TO RESTAURANTS

TO HOTELS AND MOTELS

TO SCHOOLS

TO HOSPITALS

We're busy selling your latex paint

Over 61,000 institution executives are getting the facts on latex paint performance every other month in full-page Dow ads. Hotel and motel executives, hospital and school superintendents, building and property managers . . . all get this continuing series of case histories from their own fields.

We're helping you sell latex paint to this lively market by pointing out its success in each field. We're underscoring the reasons for its success. And in each case, we outline again the unique qualities of latex paint that make it a natural choice for long-lasting beauty and easy upkeep.

Are you getting your share of these sales? Cash in on the growing demand for latex paint. Put your brand name on the paint that is the big favorite of professionals and do-it-yourselfers alike. See your Dow man about latex. Or write to THE DOW CHEMICAL COMPANY, Midland, Michigan, Plastics Sales Dept. PL 1869M.

LATEX T.M.

YOU CAN DEPEND ON DOW

NEW MATERIALS — EQUIPMENT

BRIGHTNESS METER
High-Sensitivity

Automatic, high-sensitivity brightness and reflectance meter is now available.

Instrument is composed of high-sensitivity exposure head and a measurement unit. Exposure head is designed so that samples may be measured in either horizontal or vertical position. Rubber feet installed on two sides of the instrument facilitate placement in desired position.

Dimensions of exposure head are 13″ x 13″ x 12″. Source of illumination is provided by G. E. 1209 lamp. Light beams are directed to sample in four directions by plurality of four lenses and four mirrors. Only one lamp required for four light beams.

Gardner Laboratory Inc., Dept. PVP, P.O. Box 5728, Bethesda, Md.

DEFOAMING AGENT
For Latex Paints

An auxiliary product called "Glycosperse" has been developed to overcome excessive foaming which occurs in coatings based on styrene-butadiene copolymers, PVAc and acrylic latices when the pigment paste is added to the latex.

The product is a special surfactant that acts as a pigment grinding aid and foam minimizer. It is said to be compatible with most additives, and aid in their solution and stability.

"Glycosperse" is a straw-colored, oily, non-viscous liquid said to be 100 per cent active and to contain no diluents. Economical because of small quantities required for effective results.

Glyco Products Co., Inc., Dept. PVP, Empire State Building, New York 1, N. Y.

CMR INSTRUMENT
For Opaque Material Study

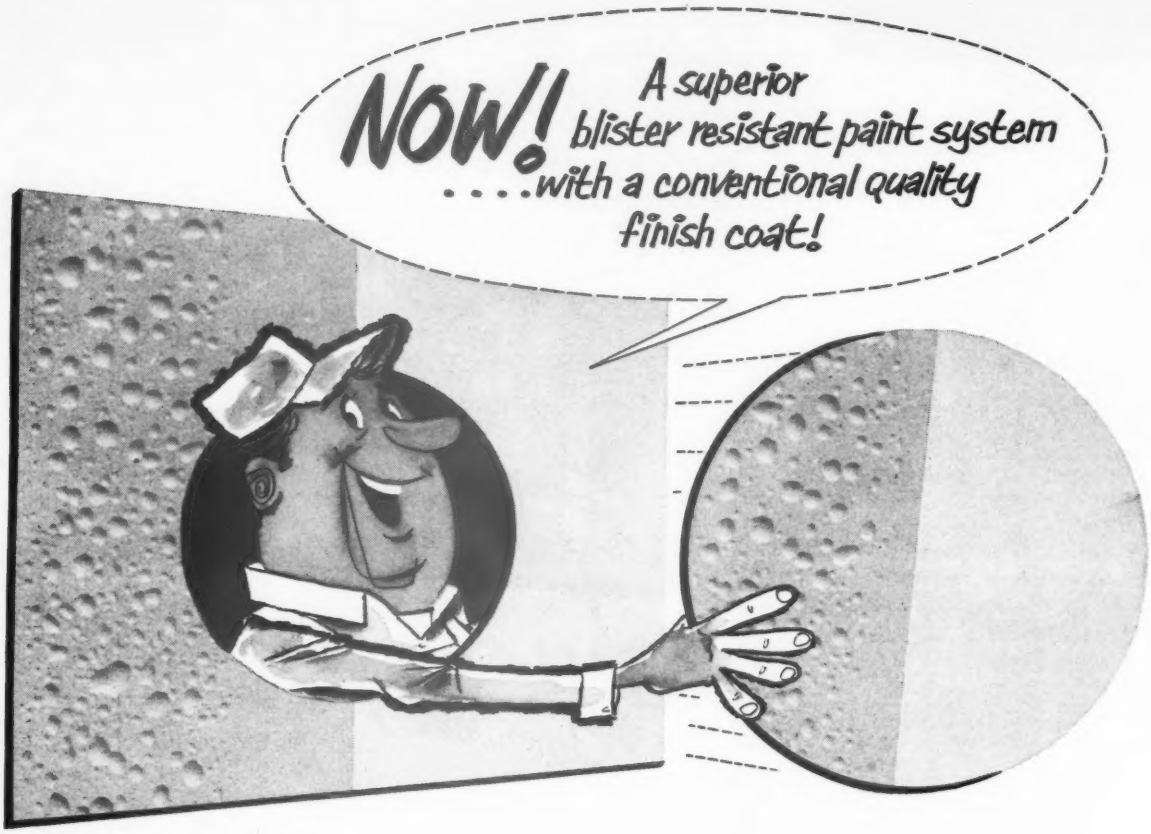
A low-cost contact micro-radiography (CMR) instrument is available for industrial research, enabling researchers to study opaque materials which are difficult to handle with visible light methods.

PHILIPS

X-ray technique also provides additional information in most types of examinations because X-rays are absorbed differently from light rays by various materials. CMR said to be valuable complimentary tool for use with light-optical and phase-contrast microscopes.

Techniques have been developed for handling wet and dry specimens. Instrument is contained in a portable cabinet approximately 14″ x 11″ x 8″, and fits on average darkroom tables.

Instruments Division, Philips Electronics, Inc., Dept. PVP, 750 S. Fulton Ave., Mount Vernon, N. Y.



TEST PANEL on right shows that no blistering occurred in the paint system using a primer formulated with Eagle-Picher Super Sublimed White Lead—top coated with Federal Specification TT-P-103.

Yours...with EAGLE-PICHER Super Sublimed White Lead!

Accelerated tests prove that blistering *does not occur* when quality house paint primers are formulated with Eagle-Picher Super Sublimed White Lead. Even under adverse moisture conditions, these primers show very little water absorption, low volumetric swelling and superior adhesive characteristics.

Equally important—Eagle-Picher Sublimed White Lead makes your primer an *all-purpose primer* . . . compatible with *any* quality top coat house paint.

Since 1843

EAGLE EP PICHER

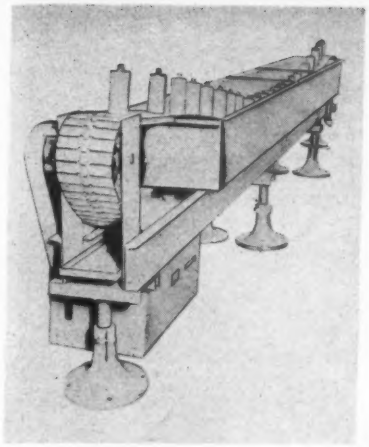
EAGLE-PICHER

The Eagle-Picher Company • Cincinnati 1, Ohio

Regional sales offices: Atlanta, Chicago, Cleveland, Dallas, New York, Philadelphia, Pittsburgh

West Coast sales agent: THE BUNKER HILL COMPANY, Chemical Products Division
Seattle • Portland • Oakland • San Francisco • Los Angeles • Kellogg, Idaho

NEW MATERIALS — EQUIPMENT



ISLAND

TEST TANK
Automatic Test for Aerosols

Heat and leak test tank is available for testing aerosols automatically. Unit consists of a tank and movable chain belt that carries the aerosol down into the tank and up out of it.

Stainless steel Rex Table-Top chain comes in widths for single or double rows of aerosols. Cans prevented from floating or slipping on incline and decline by magnets attached to chain track.

Tank may be constructed of hot-dip galvanized or stainless steel, and unit serves as both heat and leak test tank.

Island Equipment Corp., Dept. PVP, 27-01 Bridge Plaza North, Long Island City, N. Y.

LABEL PASTERS
For Ungummed Labels

Counterboy Label Pasters, manual, motor driven and automatic feed, handle ungummed labels from ½" to 18" wide.

Glue is applied as full coverage with adjustable controlled supply, or along edge of surface. Where tight adhesion is a problem, electric heaters are available to keep flexible animal glue at proper working temperature.

Pasters are available in 14 models from Better Packages, Inc., Dept. PVP, Shelton, Conn.

SUSPENDING AGENT
Imparts Thixotropic Body

A heat stable thickening agent called "Thick Aid" is now being offered.

Product said to form a gel structure of strong suspending power, imparting viscosity which eliminates sagging, prevents settling and penetration and improves brushability, color and sheen uniformity.

Manufacturer says pigment flooding is inhibited when product is added in small amounts to paints. Product is composed of processed clay which imparts thixotropic body.

Abco Chemical Co., Dept. PVP, 2316 Atlantic Ave., Brooklyn 33, N. Y.

SURFACE-ACTIVE AGENT
Speeds Emulsification

Kelecin 1081 is the trade name of a lecithin surface-active agent whose function is to increase speed of emulsification and aid in pigment grinding and dispersion for all types of water base paints.

Product is described as being especially low in viscosity and light in color compared to other materials used for similar purposes. Said to be effective in promoting emulsion stability.

Samples available from Technical Service Dept., Dept. PVP, Spencer Kellogg and Sons, Inc., Buffalo 5, N. Y.

To boost visibility and lengthen service life the state of California specifies CELITE diatomite

TRAFFIC flows more smoothly . . . accidents are reduced when traffic lines and direction markings are easier to see. That's why many states specify Celite* in their traffic paints. Celite's microscopic particles roughen the texture, increase reflectivity and give you a roadway stripe that is highly visible day and night.

At the same time, Celite's unique particle structure produces an interlacing film reinforcement for better resistance to abrasion and cracking. Johns-Manville Celite also promotes rapid solvent release for faster drying stripes.

Find out how Celite helps improve visibility and durability in traffic paints. Write for further information to Johns-Manville, Box 14, New York 16, N.Y. In Canada, Port Credit, Ontario.

*Celite is Johns-Manville's registered trade mark for its diatomaceous silica products

JM Johns-Manville CELITE Diatomite Pigments

PERSONNEL CHANGES

GOODYEAR

J. Platner

E. W. Scott

John Platner has been appointed assistant manager of the coatings department, replacing G. H. Campbell who was recently transferred to the Goodyear International Corp.

Mr. Platner has been with the company since 1947, and was engaged in film research for six years before joining the chemical division. He has been a coatings department sales service representative for the past four years.

He holds B.S. and M.S. degrees in Chemistry from Heidelberg College and the University of Akron, and is an active member of the advisory committee of the Division of Paint, Plastics and Printing Ink Chemistry of the A.C.S.

E. W. Scott has been named manager of sales development for specialty coatings. He was formerly service representative for that department.

Mr. Scott has been with the company since 1954, and has had more than 13 years of experience in the formulation and development of coatings for the paper and textile industries.

He is a graduate of the University of Wisconsin, and has done graduate work at Northwestern University and Union College.

J. P. Talley has taken over the sales service position formerly held by Mr. Platner. Prior to his appointment he was a development engineer in the chemical division laboratories.

Mr. Talley received a B.S. in Chemistry from the College of the Ozarks, and has done graduate work in paint technology at North Dakota Agricultural College. He joined the company in 1954.

O'BRIEN CORP.

William Morris has been appointed general manager of the Oklahoma City plant, it has been announced by the firm.

Mr. Morris, who has been with the firm for 11 years, was transferred from the Ft. Wayne, Ind., sales territory.

COMMERCIAL SOLVENTS

Dr. Louis L. Hallock has been named assistant manager of the market development department, it has been announced.

Dr. Hallock has been with the firm since 1947, and has held a series of increasingly responsible positions with the company. He is a graduate of Illinois College, and holds a Ph.D. in Organic Chemistry from Iowa State University.

He is a member of the American Chemical Society and the Commercial Chemical Development Assoc.

A. Mosher Cooke has replaced Dr. Hallock as product supervisor for industrial chemicals. He has been with the company since 1932, and was manager of the Boston district office before joining the market development department.

Mr. Cooke is a Chemical Engineering graduate of Yale University and a member of the ACS.

Gene E. Alley has become an industrial chemicals sales representative, with headquarters in the Los Angeles office.

Mr. Alley, a chemical engineer, was engaged in chemical research and sales work before joining the firm.

James A. Farley has been named field sales manager, it has also been announced.

Mr. Farley has been with the firm since 1935, most recently as field sales manager for the industrial chemicals department. His headquarters will be in New York.

Where odor is a problem use these

SHELL SOLVENTS

SHELL SOL 71 AND 72

. . . have no odor, are ideal for interior finishes, polishes and cleaners. Shell Sol 71 offers slightly faster evaporation.

SHELL 360 SOLVENT

. . . faster evaporation, low odor, over 100° F. flash point.

SHELL SOL 140

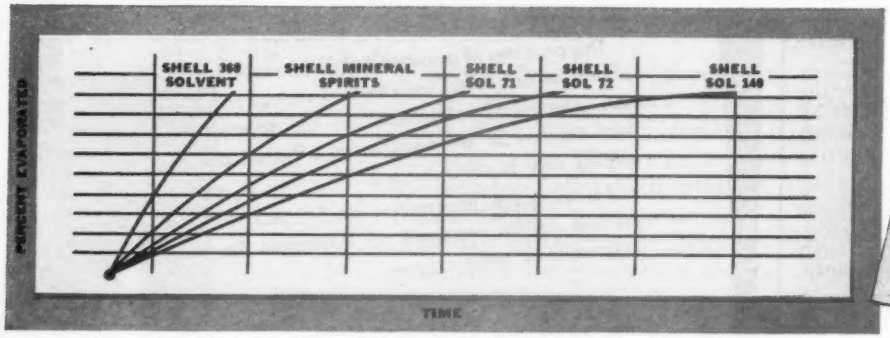
A high-flash, slow drying solvent with a very mild odor.

SHELL MINERAL SPIRITS

. . . traditional distillation range, solvent power and drying. Mild odor.

These solvents are recommended for low odor and odorless products.

Typical properties of these Shell Solvents are contained in booklet shown. It will be mailed on request.



SHELL OIL COMPANY

50 WEST 50TH STREET, NEW YORK 20, NEW YORK
100 BUSH STREET, SAN FRANCISCO 6, CALIFORNIA

SHELL

EMERY INDUSTRIES

James W. Ritz has been promoted to assistant sales manager of the organic chemical sales department, it has been announced.

J. W. Ritz

Mr. Ritz succeeds R. T. Hull, who has recently been named vice president and general manager of the firm's newly acquired Canadian subsidiary.

Mr. Ritz joined the company in 1941 as a research chemist. He has been district manager in the Philadelphia area and Eastern district manager of the chemical sales department. He is a graduate of the University of Cincinnati.

W. N. Fieglein has been appointed to the Southwest sales territory. He will handle the sales of fatty acids.

Mr. Fieglein attended the University of Cincinnati and the University of Alabama. He joined the research department in 1941, and has been a foreman in the production department for the last seven years.

Joseph P. Clancy has been appointed Eastern district sales manager of the organic chemicals sales department.

Mr. Clancy joined the firm in 1949, serving in the Southern sales territory. He was later chemical sales representative in New England. He is a graduate of Clemson Agricultural College.

Also announced were the appointments of **Joseph E. Quinty** to the Chicago office, and **William C. Sowers** to the New York office. **Arthur R. McDermott** succeeds Mr. Clancy as New England representative.

UNION CARBIDE

A. Lyndon Foscue, Birny Mason, Jr., and **Edwin B. Suydam** have been elected vice presidents and appointed members of the organization's appropriations committee, it has been announced.

Mr. Foscue has been with the company since 1924, when he joined Electro Metallurgical Co. as a chemist. He is a graduate of Davidson College with a B.S. in Chemistry. He became president of Electro Metallurgical in 1953, and was made president of Haynes Stellite Co. in 1954.

Mr. Mason, a graduate of Cornell University, joined the organization in 1932 as a researcher for Carbide and Carbon Chemicals Co. He is secretary of the corporation and is president of the Union Carbide Development Co.

Mr. Suydam became a salesman for Union Carbide Sales Co. in 1916. He became vice president of Linde in 1942 and president in 1955.

D. M. Nielsen has been appointed assistant district manager of the New York district sales office, and **R. H. Rehm** has become assistant district manager of the Newark district sales office of Union Carbide Chemicals Co.

Mr. Nielsen received a B.S. in Chemistry from Princeton University, and joined the company in 1947. He was formerly a technical representative in the New York district office.

Mr. Rehm also received a B.S. in Chemistry from Princeton, and joined the company in 1946. He had been a technical representative in the Buffalo district office prior to his promotion.

Three promotions have been announced at the Institute, W. Va., plant. **J. H. Field** has become area supervisor of the polyethylene area, and **D. P. Heath** and **P. W. Pontius** have been appointed department heads in the same area.

Hermann K. Intemann has been appointed president of Electro Metallurgical Co. division of the company, according to an announcement by Morse G. Dial, president of the Corporation.

Mr. Intemann joined the parent organization in 1930 as a laboratory technician for the Halowax Corp. He was transferred to New York in 1940 as sales manager, and in 1944 moved to the Bakelite Co., where he became vice president and general sales manager in 1953. He was made executive vice president of Electro Metallurgical in 1956.

Mr. Intemann is a Mechanical Engineering graduate of Stevens Institute of Technology.

McDANEL SUPER HIGH DENSITY MILL LININGS with a specially-developed body give more production at less cost!

● The first thing you notice about McDanel Super High Density Mill Lining Brick is its pure whiteness, its smoothness. During installation it's easy to work with. Special shapes fit quickly and easily around mill doors. Mill ends fit tighter, neater.

● When grinding begins you know you've got a superior mill lining, because McDanel Lining Brick is made from a special, scientifically developed body under constant manufacturing control. Lasts up to three times longer with big savings in costs and less down time.

McDANEL Industrial CERAMICS

McDANEL
REFRACTORY PORCELAIN COMPANY
BEAVER FALLS · PENNSYLVANIA

Send for Bulletin B1-56 with the latest information on McDanel Mill Lining Brick and Grinding Balls. Do it now!

GREAT LAKES CARBON

E. J. Manion, formerly assistant general sales manager of the Dicalite division, has been promoted to general sales manager of the newly organized mining and mineral products division, with headquarters in Los Angeles.

E. J. Manion

Mr. Manion had been a member of the Dicalite sales department for 15 years. He was district sales manager in New York City for 13 years before his transfer to Los Angeles a year ago.

G. A. Russell, who had been general sales manager of the Dicalite division, has been designated general sales consultant for the remainder of his active duty until his retirement on October 1, 1957.

Mr. Russell has been with the organization for more than 25 years in sales and sales executive capacities. He represented Dicalite in Chicago and Kansas City for many years.

Gordon G. Halvorsen has been promoted to assistant general sales manager of the mining and mineral products division.

Mr. Halvorsen was formerly Cleveland district sales manager of the Dicalite division. He has been with the company for 17 years as a chemical engineer and district sales manager.

ARMOUR

Dr. John A. King has been appointed director of research, according to an announcement by Victor Conquest, vice president in charge of research and development. Dr. King is a graduate of Indiana University, class of 1938. He obtained a master's degree in 1940 and a doctor's degree in 1942 from the University of Minnesota.

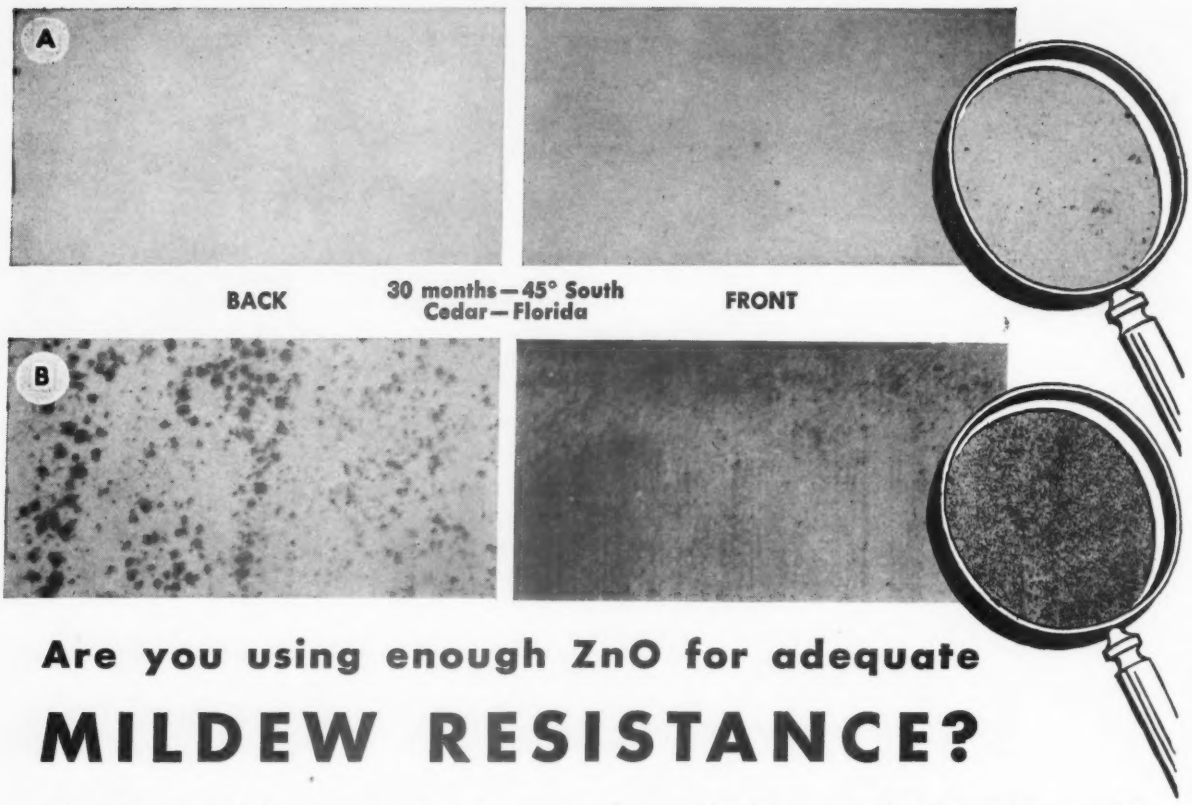
J. A. King

He has since been engaged in industrial research in the chemical and pharmaceutical fields.

REICHHOLD

H. W. DuVal has been named sales manager of the firm's chemical division, it has been announced.

Mr. DuVal had been Eastern sales manager since early last fall when he joined the firm. He was formerly an industrial account executive with Dow Chemical Co, and was in charge of the New York sales office of the R. M. Hollingshead Corp. before assuming his present position.



Are you using enough ZnO for adequate

MILDEW RESISTANCE?

The cedar panels above are coated with conventional (linseed oil vehicle) exterior paints. The only difference: the zinc oxide content in the pigment of paint B has been reduced 44.5% ... from 2.7 to 1.5 pounds per gallon.

The result? Panel A is not seriously affected by mildew after 30 months exposure. Panel B shows extreme mildew deterioration – too little Zinc Oxide to meet specific local conditions.

The qualities which are imparted to any good paint by adequate quantities of zinc oxide are well known ... and time-proved. But, in balancing a formulation, zinc oxide levels may be cut too far for customer satisfaction. With this in mind, consider:

Are you formulating your paints for maximum possible quality?

Are you formulating your paints with enough zinc oxide?

ENOUGH ZINC OXIDE GIVES YOUR PAINT ...

- **Mildew resistance**
- Durability
- Opacity to ultra-violet light
- Tint retention
- Self-cleaning action

Technical reports are now being prepared by member laboratories of AZI on the benefits of proper zinc oxide usage. To receive copies of these reports, mail coupon.

AZI

AMERICAN ZINC INSTITUTE, INC., Dept. B
60 East 42nd Street, New York 17, N. Y.

Please send me future reports on paint formulation findings.

Name_____ Title_____

Company_____

Address_____

City_____ Zone____ State_____

For Exterior Finishes...

Formulate Your *Mildew Resistant Paints* with HORSE HEAD ZINC OXIDES

Paints that contain enough zinc oxide resist mildew.

Your best source of zinc oxide is the wide range of types and grades in the Horse Head family (see table).

That variety enables you to formulate your mildew resistant paints without sacrifice of other important properties.

HORSE HEAD ZINC OXIDES

for Outside House Paint

LEAD-FREE

GRADES	PARTICLE SHAPES	PARTICLE SIZES	OIL DEMANDS
XX-2	SPICULES MULTI-FACETS JACKS	MEDIUM	16
XX-50	SPICULES MULTI-FACETS JACKS	MEDIUM LARGE	15
XX-55	SPICULES MULTI-FACETS JACKS	MEDIUM	17
XX-503	ROUNDS	LARGE	11
XX-505	SPICULES MULTI-FACETS	MEDIUM LARGE	18
XX-601	ACICULARS	MEDIUM LARGE	14

LEADED

GRADES	WHITE LEAD CONTENT %	PARTICLES	OIL DEMANDS
Lehigh-6	35	CO-FUMED	12
Lehigh-61	35	BLENDED	14
Lehigh-635	35	ACICULAR	13
Lehigh-250	50	BLENDED	12

THE NEW JERSEY ZINC COMPANY

FOUNDED 1848

160 FRONT STREET, NEW YORK 38, N. Y.

HORSE HEAD PRODUCTS

BOSTON 11, MASS. 137 Kneeland Street

CHICAGO 1, ILL. 221 North La Salle Street

CLEVELAND 14, OHIO National City Bank Bldg.

OAKLAND 4, CAL. 95 Market Street

LOS ANGELES 21, CAL. 2424 Enterprise Street

HEYDEN NEWPORT

Robert C. Palmer, vice president and chemical director of Newport Industries Co., has retired after 41 years of service.

R. C. Palmer

Mr. Palmer joined the company in 1916, and held his last post since 1944. A graduate of the University of Missouri, he holds on M.S. degree in Chemical Engineering and is a member of the American Chemical Society and the American Society of Testing Materials.

He will continue to serve as a consultant on chemical problems.

Dr. Carl Bordenca has been appointed director of research. He has been with the company since 1956, when he became assistant to the president. He was previously assistant director of Southern Research Institute, and was also associated with Visking Corp. and Alabama Polytechnic Institute.

Dr. Bordenca did graduate work at Georgia Tech, and holds a Ph.D. from Purdue.

Dr. J. Harry Stump became manager of research at the firm's Pensacola laboratories. He has been assistant chemical director since 1951.

Dr. Stump received bachelor's and master's degrees from Emory University, and a Ph.D from Pennsylvania State College. He joined the company in 1947 as a research chemist.

John F. Kilcullen has been named general production manager of all Nuodex plants. Mr. Kilcullen has been manager of the Elizabeth, N. J., plant since 1953. He joined Nuodex in 1946, serving as control chemist, chief of the pilot plant, and chief process engineer. He is a graduate of Ursinus College.

William D. Fletcher has been appointed assistant plant manager of the Elizabeth Nuodex plant. He was previously chief process engineer at the plant.

GLIDDEN

Robert T. Stroemple has become assistant director of branches for the paint division, according to an announcement by A. D. Duncan, vice president and general manager of the division.

Mr. Stroemple will work closely with the director of branches, W. G. Wickham, in representing the branches at company headquarters.

A graduate of Baldwin-Wallace College, he joined the firm in 1951 as a sales representative in the East Cleveland branch. He was appointed manager of the Lakewood, Ohio, branch in 1955.

RHEEM

G. W. Mallatratt has been elected a director of the firm at its annual meeting.

Mr. Mallatratt joined the metal-fabricating firm in 1951. He also holds the positions of vice president and treasurer. He was admitted to the bar in San Francisco in 1942.

TAMMS

Preston H. Fox, vice president, is retiring, it has been announced. He has been with the firm 36 years.

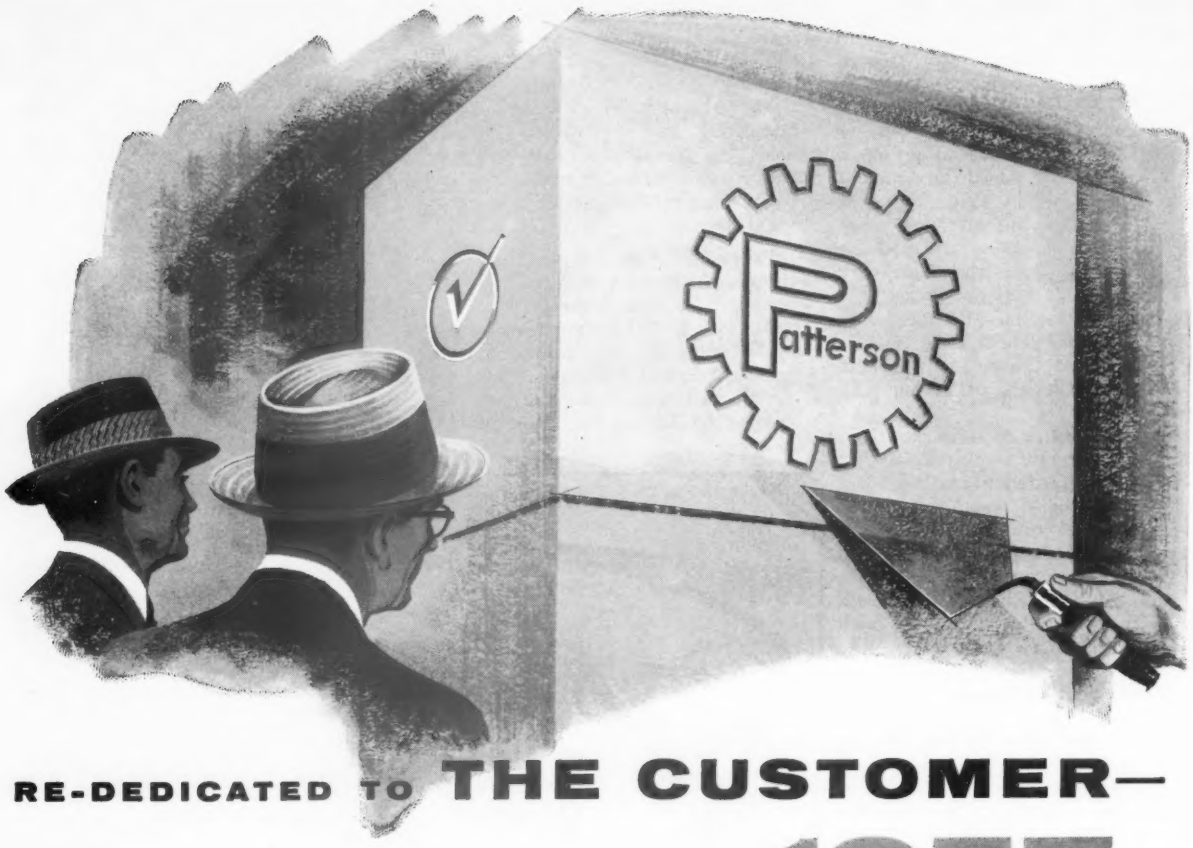
Mr. Fox headed the raw materials division supplying the paint, varnish, polish and feed industries. He will devote part time to assisting his son operate the Oilstone Co. in Hot Sp.ings, Ark.

DAVISON

Richard M. Gorman and **S. Wesley Teague** have joined the firm's industrial chemicals operation, it has been announced.

Mr. Gorman will handle sales of silicas and other chemicals in eastern Pennsylvania, Delaware, western New York and eastern Canada. He is a graduate of Ohio State University, and formerly represented the mixed fertilizer division in the Columbus, Ohio, area.

Mr. Teague will serve as a technical representative, handling silica gel, silicofluorides and catalysts. He graduated from Howard College, and was previously a technical sales representative with Linde Air Products Co.



RE-DEDICATED TO THE CUSTOMER— 1957

There's a new climate at Patterson—specially favorable to the happiness and well-being of our customers!

For over ninety years, Patterson has been known as a leading builder of equipment for the processing industries—equipment so well-made that the phrase "It's a Patterson" is a testimonial of excellence understood by everyone.

Today's Patterson management is concerned equally with the excellence of Patterson customer relations. We are organized from top to bottom to *serve* . . . through prompt inquiry handling, accurate quotations, dependable delivery promises, linked inseparably with the fine quality of engineering and product performance that is so typically Patterson.

Let us consult with you, and work with you to serve *your* interests. Write us.

ADVANCED
PROCESS EQUIPMENT
OF ENDURING SATISFACTION

THE *Patterson* FOUNDRY AND MACHINE COMPANY

A Subsidiary of Ferro Corporation

East Liverpool, Ohio, U.S.A.

The Patterson Foundry and Machine Company (Canada) Limited
Toronto, Canada

DRAVO CORP.

Oliver F. Redd has joined the firm as technical service consultant in the process equipment department, the firm has announced.

O. F. Redd

Mr. Redd was formerly director of technical service for the Patterson Foundry and Machine Co. He served as consultant to the sales and engineering departments and conducted extensive research on processing machinery for the chemical industry.

He is a graduate of Southern Illinois University and also holds a B.S. in Engineering Physics from the University of Illinois. He took graduate work in Physics at the University of Chicago.

Mr. Redd has more than 20 years of experience in the process equipment field, and is the author of numerous technical papers and articles on various phases of chemical processing.

BRI-MAR PAINT

James H. Maroney has been named general sales manager, the firm has announced.

Mr. Maroney has been with the firm since 1949 as a salesman, later becoming sales manager of specialty lines. He is a graduate of Dartmouth.

SPENCER KELLOGG

Donald J. Harris has been transferred to sales representative working out of the Chicago office, the firm has announced.

Mr. Harris was previously with the linseed oil sales record department. He joined the firm in 1955 in the administrative offices in Buffalo as a sales trainee.

He attended Union College and the University of Buffalo, and holds a B.A. in Psychology. He is an active member of the Buffalo Junior Chamber of Commerce.

KOPPERS

L. R. Hunter has been appointed sales manager of the Midwestern district of the chemical division, it has been announced by John W. Pool, Jr., sales manager for the division.

Mr. Hunter joined the firm as a foreman at the Kobuta plant in 1943. In 1955 he became assistant manager of the division's plastics products section. He received his advanced education at the University of Alabama.

George Kiessling has been transferred from the development department of the division to the plastics products section, to assist the section manager.

Harold E. Weeks has been appointed to the sales staff of the pitch and creosote section of the tar products division. He was formerly associated with the coal chemicals division of the Interlake Iron Corp.

BARRETT

James P. Barry has been named assistant sales manager of chemical sales, it has been announced.

Mr. Barry has been with the firm since 1951, when he joined as a sales trainee. He has since been a sales representative in the Buffalo and Cleveland territories.

He is a graduate of Penn State College, with a B.A. in Chemistry.

Also announced has been the appointment of three new sales representatives in chemical sales.

Henry L. Schmitt will handle the southern New Jersey and northeastern Pennsylvania area, **Richard L. Slover** will cover the Detroit area and **Julian S. Pruitt** will be the chemical sales representative in the Cleveland area.

Joseph McGaw has joined the staff of the research and development department, and **Martin Gurvitch** has become a chemical engineer in the same department.

Mr. McGaw is a graduate of Princeton University, and has had more than 14 years of experience in resin and allied industries.

Mr. Gurvitch, a graduate of Newark College of Engineering, recently received an M.S. in Chemical Engineering from the University of Michigan. He will carry out applications research in the field of phenolic resins.

OLIN MATHIESON

W. Adrian King has been named general sales manager of the industrial chemicals division, according to an announcement by John O. Logan, division vice president and general manager.

W. A. King

Mr. King had been manager of the division's automotive products department. He joined the firm in 1953 as manager of hydrocarbon chemical sales. He previously had been Midwestern sales manager of the plastics division of the American Cyanamid Co.

The following appointments were also announced:

James C. Laney succeeds Mr. King as manager of the automotive products department. He was formerly national accounts sales manager of that department.

James F. Newell has been appointed assistant general manager of the industrial chemicals division. He was previously manager of the products department.

Charles C. Hightower succeeds Mr. Newell as production head, after an assignment as manager of the Lake Charles, La., plant.

W. Carlton Mosely, formerly assistant plant manager at Lake Charles, has become plant manager.

Cecil L. Williamson, who has been manager of the industrial chemical division's administrative services department in Baltimore, has been appointed assistant to the division general manager.

PFIZER

Thomas A. Downey has been assigned as a representative of the technical service department's industrial section, it has been announced.

Mr. Downey began his career as a chemist in the firm's Brooklyn analytical laboratories after graduation from NYU in 1948. In 1953 he received an M.S. in Analytical Chemistry from Brooklyn Polytechnic Institute.

Charles Feldberg has joined the technical service department's food and beverage section.

Mr. Feldberg holds a B.S. in Food Technology from the University of Massachusetts and is a member of the Institute of Food Technologists.

AMERICAN CHEMICAL PAINT

George H. Williamson has been elected vice president in charge of West Coast activities, including the firm's plant at Niles, Calif.

Mr. Williamson has been associated with the company since 1935, specializing in the sales of rustproofing chemicals and processes for the metalworking field.

G. H. Williamson

E. A. Stockbower

Elsworth A. Stockbower has been appointed manager of new product sales in the metalworking chemicals division, it has been announced by G. C. Romig, president.

Mr. Stockbower joined the firm's research staff in 1947, and in 1951 was made metalworking chemicals technical service manager in the sales department. He was promoted to manager of the technical standards department in 1953.

GENERAL ANILINE & FILM

A. L. Sanchirico has been appointed a sales representative of the pigment division of General Dyestuff Co., the firm's sales division.

Mr. Sanchirico will handle sales of pigments in the Midwest, and will work out of the Chicago office. He joined the firm's technical staff in 1945, and worked on technical service problems on phthalocyanine and vat-type pigments.

He is a member of the American Chemical Society and the New York Pigment Club. He holds a B.S. from Long Island University.

CORN PRODUCTS SALES

Alexander N. McFarlane, vice president and general sales manager of Corn Products Refining Co., has been elected president of the sales company.

A. N. McFarlane

Mr. McFarlane is a graduate of Tufts University. He joined the firm's technical service department in 1934, and served successively as technical sales representative, associate director of research, manager of the chemical sales department and assistant to the general sales manager.

In 1953 he was elected vice president of the sales company, and in 1955 was made vice president and general sales manager of the parent company.

NATIONAL LEAD

Joseph H. Reid has been appointed general manager of the titanium division, it has been announced.

Mr. Reid is a vice president, director and member of the firm's executive committee. He has been with the firm since 1927, becoming assistant manager of the titanium division in 1947 and manager in 1949.

Graham W. Corddry succeeds Mr. Reid as manager of the division. He has been assistant manager since 1947, and was Eastern sales manager and general sales manager.

Mr. Corddry joined the division in 1932, after serving as director of laboratories with Devoe & Raynolds Co., Inc.

Leo L. Lewis is the new production manager in the titanium division. He succeeds C. Y. Pfoutz, who has retired.

Mr. Lewis was formerly plant manager of the division's titanium pigment plant in Sayreville, N. J. He has been with the firm since 1925.

Earl H. Schwartzkopf succeeds Mr. Lewis as plant manager at Sayreville. He has been general plant superintendent at the plant since 1947.

Harold D. Prior has been appointed technical director of the Chas. Taylor's Sons Co. subsidiary.

Mr. Prior was previously manager of the firm's Washington, D. C., office since 1955. He is a graduate of Alfred University and was first employed by the company as a ceramic engineer in the Niagara Falls laboratories of its titanium alloy manufacturing division in 1936.

Rear Admiral Martin P. Hottel, retired, succeeds Mr. Prior as manager of the Washington office.

Admiral Hottel is a graduate of the U. S. Naval Academy, and has been a submarine commander and specialist in torpedoes and underwater acoustical devices.

BAKELITE

George O. Young has been appointed technical representative for the surface coatings division in the Boston district office, it has been announced.

Mr. Young will be responsible for sales and customer service of all resins and latices used for surface coatings. He is a graduate of Seton Hall University with a B.S. in Chemistry.

John T. Ingram, Jr., has become technical representative for the same division in the Cleveland district office. He will also handle resins and latices.

Mr. Ingram is a graduate of Rutgers University and holds a master's degree in Industrial Chemistry from Columbia University. He has been with the company since 1951 as a research associate and technical representative in the Boston district office.

ATLAS ELECTRIC

Matthew J. Babey has been appointed sales and technical representative for the New York City metropolitan area, it has been announced.

Mr. Babey was formerly associated with the dyes division of American Cyanamid Co. He succeeds Fred Schlayer, who is retiring after more than 35 years with the firm.

INLAND STEEL

Frederick E. Ullman has joined the firm's Inland Steel Container Co. division as general manager of engineering, the firm has announced.

Mr. Ullman is in charge of engineering and research, and reports directly to the president. He had previously been director of engineering for Triangle Package Machinery Co. in Chicago.

He is a graduate of the University of North Carolina.

GENERAL ANILINE & FILM

Warren M. Dewing has been appointed New England branch manager for dyestuff sales, it has been announced.


W. M. Dewing

Mr. Dewing had previously been assistant branch manager since 1953, and had been branch manager in Boston prior to that. He has been in the dyestuff field since 1920, when he was first employed as a salesman by the Grasselli Chemical Co.

He is a graduate of M.I.T., where he received a B.S. in Chemistry. He succeeds Wilfred A. Lord, who recently retired.

CELANESE

Bruce S. Ainsworth has been appointed manager of the chemical division application laboratory at the company's Summit, N. J., research laboratories.

Mr. Ainsworth joined the firm in 1945 as a production department supervisor at the Bishop, Tex., chemical plant. He served in various process and production assignments until 1954, when he was transferred to chemical division headquarters in New York as coordinator of product development activities.

Mr. Ainsworth served one term as mayor of Bishop.

He is a graduate of Baylor University, and received an M.S. in Chemistry in 1940. He is a former secretary and chairman of the South Texas Section of the American Chemical Society.

Mr. Ainsworth succeeds Dr. Michael J. Curry, who was recently made laboratory manager of the Summit coordinated fiber, plastics and chemical research facilities.

VAN AMERINGEN-HAEBLER

Dr. William N. Henderson has become associated with the firm with the responsibility of coordinating research and development throughout the organization.

Dr. Henderson was previously with Allied Chemical & Dye Corp., where he worked on the development of improved processes for the manufacture of phenol and soda ash. He also introduced more efficient methods for the production of calcium chloride.

He also served with W. R. Grace & Co., where he developed the first commercial process for the production of pulp and paper products from sugar cane fibrous residues. He also installed the first sugar refinery in South America.

Dr. Henderson studied Chemistry at Clemson College, Chicago University, the University of Berlin and Princeton, where he received a Ph.D. and taught Chemistry.

ARCHER-DANIELS-MIDLAND

James H. Kane is the new sales manager of the chemical products division, it has been announced.

A Chemical Engineering graduate of Detroit Institute of Technology, Mr. Kane joined the firm in 1934 at the Wyandotte, Mich., plant, where he has been laboratory assistant, foreman and assistant plant manager.

He transferred to sales work in New York in 1946, and became assistant manager of the regional sales office in 1956.

Roger C. Schacht has become Eastern district sales manager for the chemical products division in New York. He has been a sales representative in the New York office.

Mr. Schacht is a graduate of Michigan State University with a degree in Chemistry. He joined the firm's Wyandotte laboratory in 1940, and was placed in charge there in 1942.

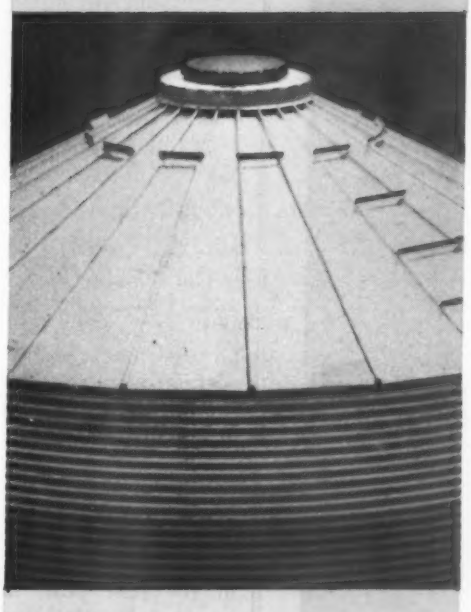
ENJAY CO.

T. Curry Jones has been named manager of the newly established Mid-Atlantic sales district, the firm has announced.

Mr. Jones has moved to the New York headquarters of the firm from the Akron district, where he had been senior sales representative. He joined the paramins division in 1948, and transferred to the butyl division in 1954.

He is a graduate of the University of North Carolina, and was with the Esso Research and Engineering Co. prior to his present association.

The gold lacquer that stays bright —outdoors



When the sales department of Black, Sivalls & Bryson, Inc., Kansas City, Mo., fabricators of metal equipment for the oil, gas, chemical and agricultural industries, suggested spot use of a gold color to "trademark" their products, the idea was enthusiastically received.

But the poor outdoor performance of conventional gold lacquers almost shelved the program. They deteriorated rapidly and within a few months became dull and tarnished. To save the idea, the problem was turned over to the M. L. Campbell Co., Kansas City, Kansas, who supplied a gold lacquer based on Half-Second Butyrate. It proved to be the answer by providing a durable, non-tarnishing film on all the various metals to which it had to be applied—cold-rolled steel, galvanized steel, aluminum, and cast iron.

Today Black, Sivalls & Bryson promotes its "Gold Dome" and "Gold Crown" line for its propane tanks, grain bins and vent valves. Thanks to Half-Second Butyrate, field life of this distinctively colored lacquer is estimated at three to five years.

Half-Second Butyrate vehicles do not react with metallic pigments. Hence, this gold lacquer can be delivered already mixed without danger of gelling during storage. Half-Second Butyrate lacquers are also easily sprayable. They have a high degree of strength, flexibility, and scuff and mar resistance. These durable lacquers resist breakdown and discoloration when exposed to sunlight. Half-Second Butyrate is a low-density material and produces high coverage per pound of film former. Important, too, is its solubility in low-cost solvent systems.

Half-Second Butyrate lacquers have solved many problems for industry. Investigate the advantages this film former offers in standard and special formulations.

Eastman

CHEMICAL PRODUCTS, INC.

KINGSPORT, TENNESSEE

subsidiary of Eastman Kodak Company

SALES OFFICES: Eastman Chemical Products, Inc., Kingsport, Tennessee; New York City; Framingham, Massachusetts; Cincinnati; Cleveland; Chicago; Houston; St. Louis. **West Coast: Wilson Meyer Co.,** San Francisco; Los Angeles; Portland; Salt Lake City; Seattle.

NEWS

Color Association Re-elects Officers, Members of Board

Current officers of the Color Assoc. of the United States were re-elected to serve another year at the organization's 42nd Annual Meeting in April.

John M. Hughlett, vice president, J. P. Stevens & Co., Inc., will serve another term as president of the Association. Armand Schwab, president, Armand Schwab & Co., Inc., was re-elected first vice president, and John F. Warner, vice president, D. B. Fuller & Co., Inc., was chosen to serve another term as second vice president.

Estelle M. Tennis, executive director of the Association, was re-elected secretary, and Henry C. Van Brederode, president, Earl Loom Fabrics, Inc., was elected to serve again as treasurer. Miss Tennis was also re-elected executive director.

Each of the officers was also re-elected to the Association's Board of Directors. Other members re-elected to the Board were: Eleanor Lambert, president, Eleanor Lambert, Inc.; William G. Lord, president, Galey & Lord, and vice president, Burlington Industries, Inc.; W. Ralph MacIntyre, president, Joseph Bancroft & Sons Co.; Newton J. Rice, president, Wear-Right Gloves, Inc.; Dorothy Shaver, president, Lord and Taylor, and vice president, Associated Dry Goods Corp., and Roy E. Tilles, past president, of the Color Assoc.

In her annual report of the Association's activities, Miss Tennis said that increased membership has come from the paint industry, one of many fields indicating a growing impact of color.

Corrosion Text Compiled

Dr. Mars G. Fontana, chairman of the Department of Metallurgical Engineering at Ohio State University, has compiled monthly columns on corrosion written during the past ten years into a book, "Corrosion: A Compilation," published by Hollenback Press, Columbus, Ohio.

Practically all metals and alloys and some non-metallics used for corrosion applications are covered. The book describes methods and detailed procedures for laboratory and plant testing, and shows corrosion as a function of temperature and concentration of acids through iso-corrosion charts.

Causes and cures for many plant problems and mechanisms of corrosion are described in readily understandable terms.

Award Distributorship

Exclusive distributorship for products of Minerals & Chemicals Corp. of America has been given to A. E. Fleming Co., 1900 E. Jefferson Ave., Detroit, Mich.

The Fleming Co. will handle sales of aluminum silicate pigments and attapulgites to the chemical process industries in Michigan, a portion of northwestern Ohio and northeastern Indiana, with warehouses in Detroit.

Flushing Machine Installed

Installation of a new 350-gallon flushing machine, the third of this capacity to be put into operation in the past year, has been announced by Dr. Harold Hansen, vice president of Sterling Drug, Inc., in charge of The Hilton-Davis Chemical Co. division.

Purpose of the additional equipment, he explained, is to increase the company's productive output of flushed colors in response to growing industrial demand.

NEWS

Navy Will Close Plants If Assured Paint Supply

The Navy has agreed to shut down its two paint producing plants if private industry will guarantee delivery of quality paint in sufficient quantities.

Meanwhile, Sen. Edward J. Thye (Rep.-Minn.), chairman of the Small Business Committee, warned the Defense Department that it must justify paint production and other business-type activities or face budget cuts by the Senate Appropriations Committee.

The Navy produces approximately 3 million gallons of marine paint annually at its Mare Island, Calif., and Norfolk, Va. plants.

Senator Thye refrained from demanding outright shutdown of the plants upon assurances from Defense Department officials that they have already recommended a shutdown to Assistant Defense Secretary Perkins McGuire.

Officials said they expected Mr. McGuire to sign a phase-out order soon.

Rear Admiral Schuyler Pyne, assistant chief of the Bureau of Ships, told a hearing of the Small Business Committee that the Navy would be willing to deal with the paint industry if specifications could be met and paints delivered when needed.

Daniel L. Boland, counsel for the National Paint, Varnish and Lacquer Assoc., said that the industry is able to meet the Navy's demands.

He said he had already supplied the Navy with a list of 65 firms which are capable of producing shipbottom paints—the only type about which the Navy has raised a question. Eleven others, he said, are able to produce all types of shipbottom coatings except the hot plastic paints.

Mr. Boland estimated that private firms are capable of producing 5½ million gallons of shipbottom coatings a year, which he said is approximately 10 times the Navy's current needs.

Ralph H. Everett, vice president of M. J. Merkin Paint Co., said that while the Navy's annual output is insignificant in terms of total U.S. commercial production, it is a sizable percentage of total marine paint production, and a volume which small business men would greatly appreciate.

NPVLA Holds Sales Meetings

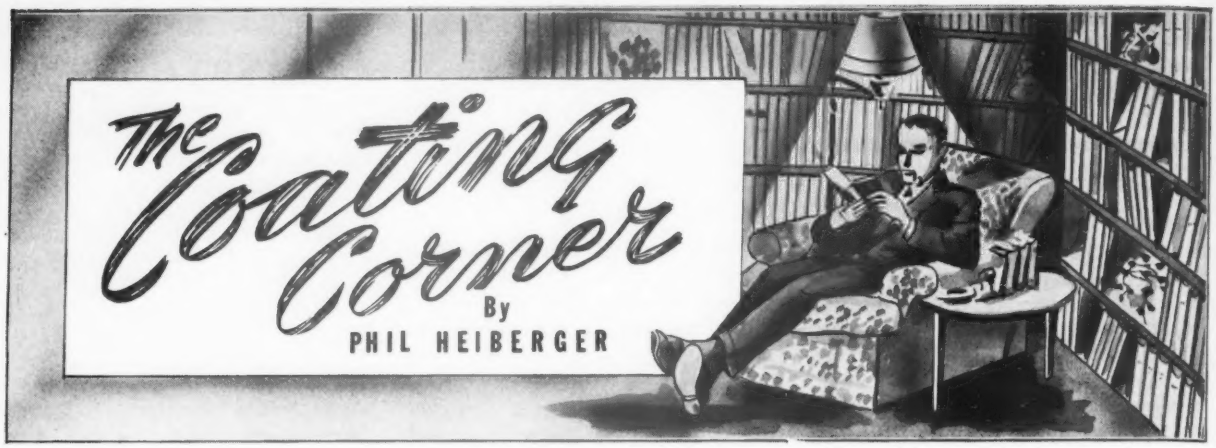
Meetings for trade sales manufacturers were held by the National Paint, Varnish and Lacquer Assoc. last month at the Hotel Warwick, Philadelphia.

A Government Paint Procurement Symposium, featuring a panel of government officials representing the four major Federal procurement agencies, was held on May 6. Representatives of the General Stores Supply Office, U. S. Navy; General Services Administration; Housing and Home Finance Agency, and Corps. of Engineers, U. S. Army, outlined procurement procedures, purchasing problems and specifications.

The Association's Trade Sales Steering Committee and the National Trade Sales Committee held a joint meeting following the symposium.

A full day of seminars was held on May 7. Topics included:

"Educating the Salesman," "Creative Selling of Our Products," "Promoting Color to Sell Our Products," "Improvement and Development of Advertising and Sales Campaigns" and "Our Markets and Competing Materials."



The author continues his random reflections on various aspects of the paint industry. The opinions expressed in this column are his alone and do not necessarily reflect those of this publication.

A Phthalocyanine Yellow?

HERE'S a footnote to our recent discussion of coordination compounds. It was mentioned, you may recall, that the organic part of the molecule is stabilized by the presence of metal ions, and phthalocyanine blues and greens were cited as examples.

Two German workers, Fritz Baumann and Berthold Bienert, were recently granted U. S. Patent 2,786,807 for disclosing a new class of cobalt phthalocyanine compounds useful in the dyeing or printing of textiles.

These cobalt complexes are close relatives of the phthalocyanine pigments which are copper complexes. The cobalt complexes, however, can be formed at lower reaction temperatures than the copper complexes, and thus can be prepared directly on the fibers.

Briefly, the new compounds are prepared by the reaction of one atom of cobalt with six molecules phthalonitrile which are converted to the complex by the application of 330° F heat. The colors range from yellow to a brown-red which can be changed to orange-red upon further reaction with a primary amine.

Pardon my optimism, but it looks as though these developments may be the forerunners of the long wanted stable yellow and red pigments for use in exterior formulations.

Phil Heiberger

Simple Test For Cross-Linking

HERE'S another example of a rapid, simple technique to describe what was hitherto a complex, time consuming analysis. Certain linear polymers, which have been used as picture varnishes, are known to become cross-linked by the action of light. Museum workers are interested in determining the ease of this cross-linking mechanism because the resulting insolubility made it impossible to remove the protective varnish by solvent action alone.

Garry Thomson, of the Scientific Department, National Gallery, London, describes in *Nature* 178, 807 (1956) a simple chromatographic method which could be completed within an hour.

This technique involves essentially the transfer of a tiny fragment of the aged varnish film to the bottom of the filter paper strip. Several drops of a suitable strong solvent for the varnish are used to leach the fragment, and the solubles are then developed as an ordinary paper chromatograph.

A long streak of soluble polymer moves along the paper as long as leaching continues. When all the solubles are removed from the fragment, the streak ends suddenly to form a rounded tail. Any insoluble polymer remains stationary at the origin. For example, polyvinyl acetate was found stable to cross-linking whereas a polymethacrylate specimen became partially insoluble.

This method can be rendered quantitative and, unless I miss my guess, its value extends beyond the preservation of oil paintings.

Cross-Linking—Key to Aging?

TALKING about cross-linking, let's stop a moment and turn our attention to a related subject—one with more human interest—old age. Apparently cross-linking has considerable influence on the aging process.

Johan Bjorksten proposed a theory some time ago that biological aging may be due to certain types of cross-linking, involving a slowly progressing polymerization or denaturation of protein molecules, making the proteins incapable of

participating further in body processes, leading to clogging of cells with inactive protein.

In a news item in *Chemical Engineering News*, page 1957, May 9, 1955, Bjorksten cited these facts to demonstrate the soundness of his theory:

"Loss of elasticity in many body tissues is a characteristic of old age—and of cross-linking.

"Increased brittleness of rigid tissues is a characteristic of old age—and of cross-linking.

"Decline of percentage of bound water is a characteristic of old age—and of cross-linking in water-binding proteins.

"Increased blood pressure would seem connected with impairment of elasticity of the arteries, also a symptom of old age—and is a symptom in poisoning with the best known cross-linking agents such as lead or mercury.

"Animals on very low calorie diets show substantially increased life spans. A low calorie diet makes for a minimum of by-products of metabolism, which might act as cross-linkers.

"Excessive exposure to radioactivity causes symptoms indistinguishable from accelerated aging and reduced life span. It is well known that irradiation causes cross-linkages."

Was it Mark Twain who said, "Everybody talks about the weather but nobody does anything about it?" (Of course he made that remark before the era of the cloud seeders.) Twain's remark applied pretty well also to the subject of what's euphemistically called the "golden years," but which too many people experience as an unhappy, painful time of life. It's good to know, then, that Bjorksten and others (we hope) are actively working out methods to slow up cross-linking, synonymous, it seems, with slowing up our aging process.

Practical Uses of Radioisotopes

WHEN papers on a given topic begin to appear regularly in the trade magazines, we can say with assurance that this topic is no longer just a laboratory curiosity or an academic tool. Radioisotope techniques are a case in point. Already this year several direct applications to the coatings industry have been reported along with significant findings which, without isotopes, may well have remained forever a mystery—at least, for a long, long time.

The paper by A. L. Glass and M. S. Pellegrini entitled "Use of the Radioactive Tracer Technique in Aircraft Paints," published in *Official Digest 29*, 49, 1957, will not be detailed here since the paper is so readily accessible.

However, it is worth noting that this paper blasts a hunch which might have involved a tremendous amount of work to otherwise disprove it. The paper is noteworthy also because it is an excellent example of the frequent value of negative data.

It had been suspected that poor adhesion could result from the contamination of monolayers of stearic acid or other fatty acids forming on the metal surfaces and surviving the paint stripping and cleaning procedures prior to painting. If this were true, an intensive program might have been necessary to reformulate the standard zinc chromate primer.

By proving that no monolayer of stearic acid could remain under the prescribed conditions, this work made reformulation unnecessary. Thus, immeasurable time and effort was saved for expenditure in more profitable channels.

Milk Carton Coatings

WHEN we're dealing with potential food contaminants, on the other hand, positive data must be obtained. Radiotracer techniques were used as an analytical tool in determining the extent to which polyvinyl alcohol, a common component of food-package adhesives, might contaminate milk carton contents. This was part of a program on the safety evaluation of chemical components used in the construction of liquid-tight food containers.

This work was reported in a paper by D. G. Lundgren, J. H. Peterson, and E. P. Czerwin which appeared in the February 1957 issue of Modern Packaging. Two adhesives formulations were used, one containing normal quantities of polyvinyl alcohol (PVA) (10-20%) and one containing high PVA contents (40-60%) on adhesive solids. The PVA was labeled with Carbon-14. Water was used in place of milk as the extractant in order to increase the accuracy of the activity measurements.

Actual quantities of PVA involved were equivalent to 21.5 mg. and 48 mg. per carton. Storage conditions varied from 3 days at room temperature to 7 days in the refrigerator. Ten one-pint cartons containing 470 ml. water were used for each adhesive and condition. Cartons were shaken twice a day to simulate normal handling.

Results showed that migration of PVA from milk-carton adhesives approached zero. The sensitivity of the analytical method was better than 0.0025 ppm—equivalent to the detection of 0.025 micrograms of PVA in a 10 ml. sample. This amount of PVA migration was found to be well below 0.01 ppm, the currently accepted permissable maximum.

Welcome

HEARTY welcome to a newcomer in the family of plasitcs—the polycarbonates.

As a matter of fact, the polycarbonates are close cousins to the epoxies; whereas the polycarbonates are made by condensing polyphenols with phosgene, the epoxies are made by condensing polyphenols with epichlorhydrin.

According to an announcement in the April 6 issue of *Chemical Week*, page 96, these new thermoplastics are expected to have outstanding heat distortion and strength, comparable to thermosetting plastics.

At the moment it's debatable whether the polycarbonates will have a place as a film former. While polycarbonates are resistant to water, higher alcohols, and aliphatic hydrocarbons, other solvents cause swelling. Furthermore, the polycarbonates are attacked by dilute alkali and are dissolved by chlorinated hydrocarbons.

A French Exercise

TO those who enjoy sharpening their skill in reading French, I heartily recommend a review by G. Genin entitled "Radioisotopes in the Paint Industry." This article appears in the December 1956 issue of *Peintures, Pigments, Vernis.*

NEWS

Naugautck Expands Units

The Naugatuck Chemical Division of U. S. Rubber Co. has announced the completion of a $2 million project to increase by 60 per cent the production of Paracril at its Baton Rouge, La., plant.

Also announced was the beginning of construction on a $7 million chemical plant on a 150-acre site in the Scotts Bluff area of Baton Rouge. The new plant will be used for the production of Kralastic plastic materials.

The Paracril expansion was accomplished by the addition of new equipment and the modification of existing units at the Baton Rouge plant.

The Kralastic plant is expected to employ approximately 125 persons, and is scheduled for completion in December. The plant is expected to triple the Divisions Kralastic production capacity.

•

Sees Vinyl Paint Tripling

Vinyl paint production in the United States should more than triple in the next four years, according to one source.

James Dillon, vice president of National Starch Products, Inc., made the prediction at the company's annual resin and structural products division sales meeting late in April.

Mr. Dillon estimated that domestic production of vinyl paints should reach 30 million gallons by 1961 as compared to 10 million gallons produced domestically last year.

He said vinyl resin sales have shown a great gain in the first quarter of this year, despite a drop in housing construction and poor painting weather in some parts of the nation.

According to Mr. Dillon, a widespread introduction of vinyls for interior latex paints has been indicated, whereas previously their main use had been confined to exterior masonry.

•

Lanson Joins U. S. Vehicle

Dr. H. J. Lanson, nationally known authority on synthetic coating resins and drying oils, has acquired a substantial interest in the U. S. Vehicle & Chemical Co., according to an announcement made by W. J. Moore, president of the St. Louis, Mo., firm.

H. J. Lanson

Dr. Lanson holds a Ph.D. in Organic Chemistry. He has served as group leader of a government-sponsored scientific research team, and has been technical director and senior research chemist for several corporations. He has been supervisor of development on alkyds and other coating resins for General Electric.

Author of the section on Alkyd Resins in the newly-published Encyclopedia of Chemistry, Dr. Lanson has written a number of articles on drying oils and alkyd and polyester resins. He is currently a lecturer on synthetic resins and plastics at the Graduate School of Engineering, Washington University in St. Louis.

Dr. Lanson will head an expanded program of research and development at U. S. Vehicle. The firm expects to have a new resin plant in full operation this month.

FOR TRADE SALES specify ARALDITE® epoxy resin

6084

The requirements for trade sales . . . lower cost, one-package systems, solvency in aliphatics, and easy hand application by brush or roller . . . are admirably met by CIBA Araldite 6084. Specify it with confidence when formulating . . .

Wall finishes
Furniture finishes
Floor coatings Spar varnish
Trim enamels Marine enamels

Industrial and maintenance finishes, too!

The versatility of Araldite 6084 esters allows their use for industrial and maintenance finishes. Addition of other Araldite Epoxy Resins will speed up or slow down reaction times, increase viscosity or reduce it to take more solids. Depending on the choice and proportion of acid used, Araldite 6084 esters can be made very pale, fast drying, extremely flexible, extremely tough.

C I B A

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PATENTS

Complete copies of any patents or trade-mark registration reported below may be obtained by sending 50c for each copy desired (to foreign countries $1.00 per copy) to the publisher.

Polymerization of Acrylic Acid

U. S. Patent 2,789,099. Howard M. Rife, Charleston, and Alexander H. Walker, S. Charleston, W. Va., assignors to Union Carbide Corp., a corporation of New York.

Process for the preparation of stable aqueous solutions of polyacrylic acid which comprises polymerizing acrylic acid monomer in an aqueous solution containing a water-soluble peroxide catalyst and a small amount of polymerization control agent consisting of water-soluble cupric salts selected from the group consisting of cupric acetate monohydrate, cupric lactate, cupric formate, cupric chloride, cupric sulfate, cupric nitrate and cupric selenate and water-soluble alkali metal hypophosphites, said amount being at least 0.05% by weight of the monomer in the instance of the cupric salts and at least 0.1% by weight of the monomer in the instance of the hypophosphites.

Stabilized Vinyl Chloride Compositions

U. S. Patent 2,789,100. Joseph E. Wilson, New Brunswick, N. J., assignor to Union Carbide Corp., a corporation of New York.

A composition of matter comprising a polyvinyl chloride resin, a plasticizer for said resin, dibutyl tin dilaurate and from 0.5 to 10 percent by weight of the resin of ethyl ortho-silicate.

Anti-Skinning Agents

U. S. Patent 2,789,955. Eugene W. Moffett, Milwaukee, Wis., assignor to Pittsburgh Plate Glass Co., Pittsburgh, Pa., a corporation.

A liquid coating material containing a mixture of a drying glyceride oil and a siccative which is an organic salt of a drier metal, said salt being soluble in glyceride drying oil which mixture is characterized by a tendency to form skins when stored in bulk in a closed container, said material being stabilized against skinning by 3-isopropyl catechol, said catechol being present in an amount to inhibit skinning of a 150 milliliter sample of the material in a closed one pint tin can for at least 48 hours.

Vinyl Chloride Compositions

U. S. Patent 2,789,101. Joseph E. Wilson, New Brunswick, N. J., assignor to Union Carbide Corp., a corporation of New York.

A composition of matter comprising a polyvinyl chloride resin, a plasticizer for said resin, dibutyl tin dilaurate and from 0.5 to 10 percent by weight of the resin of ethyl ortho-formate.

Asphalt Emulsion

U. S. Patent 2,789,917. Harley F. Hardman, Lyndhurst, and Robert F. Jenkins, Cleveland, Ohio, assignors to The Standard Oil Co., Cleveland, Ohio, a corporation of Ohio.

A method of producing an asphalt emulsion which comprises intimately mixing an oleaginous material in an amount of 0.05 to 2% by weight of the total emulsion reactive with an alkali metal base to form a soap and 0.05 to 2% by weight aluminum sulfate based on the weight of the asphalt with asphalt, and subsequently emulsifying the resulting asphalt mixture with an aqueous solution of a water soluble soap and an alkali metal base, said base being present in amounts sufficient to maintain the emulsion at a pH above 7.

Coating Composition

U. S. Patent 2,787,555. Folsom E. Drummond, Washington, D. C., assignor to Midland Chemical Corp., Dayton, Ohio, a corporation of Delaware.

A liquid coating composition comprising a substantially colorless varnish vehicle and a mixture of glass fibers and cellulose acetate fibers, said cellulose acetate fibers being blue colored by the incorporation of 1.4 di-(phenylamino)-anthraquinone, said colored acetate fibers being present in an amount to provide a colored coating composition, and said glass fibers being uncolored.

Water-Soluble Resin

U. S. Patent 2,789,098. Harold A. Collinson, Brockenhurst, Eng., assignor to Leicester, Lovell & Co., Ltd., N. Baddesley, Southampton, Eng.

A water-soluble synthetic resin composition comprising a resin condensate physically admixed with furfuraldehyde as a non-crazing agent, said resin condensate being the product of reacting formaldehyde with an amine of the class consisting of urea and thiourea.

Pesticidal Composition

U. S. Patent 2,789,060. Willy Spangenberg, Hamburg-Blankenese, and Karl Culemeyer, Hamburg-Langenfelde, Germany, assignors to Willy Spangenberg & Co., Hamburg-Eidelstadt, Germany.

A pesticidal coating composition adapted for the treatment of wood and as a priming coat therefor consisting essentially of a major proportion of at least one drying oil which is an ester of a higher unsaturated fatty acid and a polyfunctional alcohol, the latter having at least four carbon atoms, said ester having distributed therethrough a minor proportion of at least one pesticide.

Silk Screen Paint Materials

U. S. Patent 2,790,726. Wilson G. Dietrich, Faribault, Minn., assignor to Wilson Arts & Crafts, Faribault, Minn., a corporation of Minnesota.

A coagulative and non-bleeding screen stencil paint material consisting essentially of from 1 part pigment to 20 parts bentonite by volume to 20 parts pigment to 1 part bentonite by volume, all of said materials passing 200 mesh, and from .02 part by volume to .1 part by volume of borax, all of said materials mixed in water, the ratio of the volume of water to dry materials being the ratio of from 3 to 1 to 4 to 1.

NEWS

Expect N. Y. Job Rise

The New York City employment outlook was less optimistic in April than it had been in months previous, but employers still expected an employment rise by mid-year, according to a State Labor Dept. report.

The report was made by Isador Lubin, New York State Dept. of Labor Industrial Commissioner, after reviewing an opinion survey of New York firms.

Factors cited by employers for their dampened optimism included the tightening of credit, falling off of new orders for machinery, the continuing decline in textile and apparel production and the reduced demand for certain household equipment in the wake of a cutback in residential construction.

Mr. Lubin said that on the brighter side, however, was the continued expansion of the work force in banking-insurance-finance and the service industries. Overall construction employment in the city was also up, despite cutbacks in residential construction.

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Sherwin-Williams Plans Unit

The Sherwin-Williams Co. has announced plans for the immediate construction of a plant to produce barium monohydrate.

S. B. Coolidge, vice president and director of auxiliaries for the paint and chemical firm, said that the new facility would be built adjacent to the firm's barium carbonate plant at Coffeyville, Kans.

Plans for the new unit, which is to cost more than one million dollars, are now being drawn, according to the announcement. The plant is expected to begin production early in 1958.

A new process developed by Sherwin-Williams will be used for the production of barium hydrate from barytes ore. Mr. Coolidge said the new method will allow for "at least 99 per cent purity" in the production of barium monohydrate.

PR Film Released

A 15-minute sound and color public relations film has been prepared for release this month by Devoe & Raynolds Co., Inc., Louisville, Ky.

Titled "The Duchess Paints the Town," the film is on research and quality control in the manufacture of paint. It stars Gail Patrick, motion picture and television performer, and Richard Davis, Chicago stage and television personality.

While designed primarily for dealers, architects, painting contractors and institutional maintenance groups, the motion picture is said to be educational and entertaining enough to be enjoyed by the general public. It will be released for public service television after showings to special groups.

The film was produced by Kent Lane Films of Louisville, and is being released through Devoe & Raynolds outlets from coast to coast.

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New Trademark

Diamond Alkali Co. of Cleveland, O., has announced the adoption of a new trademark which will be used to identify its corporate organization and chemical products.

The new mark, called the "Chemical Diamond," suggests both the letter "d" and a chemical retort, traditional symbol of the chemical industry. A vertical diamond is contained within the emblem.

NEWS

Plan NPVLA Anniversary Fete

The National Paint, Varnish and Lacquer Assoc. has held special committee meetings for the planning of the Association's 70th Anniversary celebrations.

General Joseph F. Battley, president of the Association, said that plans were discussed in Augusta, Ga., in April. More than 1400 representatives of the industry are expected to attend the celebration at the Sheraton-Park Hotel in Washington, D.C., November 4.

According to General Battley, nationally prominent speakers from business, industry and government are being scheduled for the event. Special entertainment and social activities are planned for members and their wives.

"Progress through Cooperation" will be the keynote theme, General Battley said.

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John J. Mulvehill Passes

John J. Mulvehill, Minneapolis sales representative for the O'Brien Corp., died April 12. He was a representative for O'Brien in the Midwest and Northwest for more than 54 years.

Jerome J. Crowley, Jr., president of O'Brien, said Mr. Mulvehill was "truly the dean of O'Brien Corp. salesmen."

Mr. Mulvehill is survived by his sons Robert F. and Jerome P. of Minneapolis, his brother Emmett P. of Oklahoma City and a nephew John P., all of whom are O'Brien representatives.

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Sun Chemical Moves Offices

Sun Chemical Corp. will move its administrative and executive offices from Long Island City to New York City early next year, according to an announcement by Norman E. Alexander, president.

The announcement said that the firm leased 42,000 square feet in a new 34-story building being erected by Uris Brothers at 750 Third Ave., between 46th and 47th Streets.

No manufacturing or research activities will be affected by the move, Mr. Alexander said.

abstracts

The following are abstracts of papers presented at the April 7-12 meeting of the American Chemical Society, Division of Paint, Plastics, and Printing Ink Chemistry, in Miami, Florida.

Effect of Tall Oil Rosin on Yellowing of Interior Enamels

by R. D. Bitting, B. G. Brand and E. E. McSweeney, Battelle Memorial Institute, Columbus, Ohio.

The effect of the type and amount of rosin on the yellowing of two typical interior enamels was investigated. The study has shown that either tall oil or wood rosin imparts the same rate of yellowing when incorporated into comparable vehicles. An alkyd vehicle containing 10% rosin was equivalent to a rosin-free alkyd in rate of yellowing and the total yellowness of pigmented films. Under certain conditions, rosin appears to retard yellowness development. The type of oil used did not appear to affect the rate of yellowing. It was therefore concluded that the presence of rosin is not nearly as detrimental to the rate of yellowing of paint films as has been generally believed.

Topography of Pressure-Sensitive Adhesive Films

by C. W. Hock and A. N. Abbott, Research Center, Hercules Powder Co., Wilmington, Del.

The particular combination of qualities required for good adhesion is not well understood. It was suspected, however, that topography might be a contributory factor. Accordingly the surface configuration of a variety of rosin-derived resin-rubber adhesive films which differed in chemical composition, in aging treatment, and, correspondingly, in tack was studied by means of electron microscopy.

A correlation was observed between the surface irregularity of the films and their tack. Adhesive films with high tack showed a two-phase structure. Apparently the continuous phase consists of rubber saturated with resin, whereas the disperse phase consists of resin and low molecular weight rubber molecules. The disperse phase is present as more or less spherical particles, some of which are located at the surface, giving it a pimpled character. Films having low tack, whether inherent or induced by aging, have smooth surfaces.

A good adhesive must first deform sufficiently to come in intimate contact with the substrate and then maintain that contact after it has been effected. In the two-phase systems studied it is, presumably, the easily-deformed continuous phase, consisting largely of rubber, which makes it possible to bring the submicroscopic tack-bearing resin particles into close contact with the substrate.

Diisocyanates-Castor Oil-Rosin Coatings

by W. Szukiewicz, J. W. Hull, G. C. Toone and M. E. Bailey, Research and Development, National Aniline Division, Allied Chemical and Dye Corp., Buffalo, N. Y.

Surface coatings possessing outstanding chemical resistance can be prepared from the reaction of tolylene diisocyanate (TDI) or diphenyl-methane-4,4′-diisocyanate (MDI) and castor oil, using various amines (such as methyldiethanolamine or N-ethylmorpholine) as curing agents. Coatings prepared from these reactions also show excellent

abrasion resistance, hardness, and adhesion to most substrates.

Small amounts (1 to 4%) of a partially polymerized rosin, when reacted with the above adducts prior to the addition of curing agents, improve the properties of the resultant coatings. Drying rates of the coatings are significantly increased, abrasion resistance and hardness are increased, tensile strength of the MDI-castor oil film is increased, and resistance of the films to softening at elevated temperatures is increased.

Liquid Phase Catalytic Isomerization of α-Pinene

by V. P. Wystrach, L. H. Barnum and M. Garber, Stamford Laboratories, Research Division, American Cyanamid Co., Stamford, Conn.

α-Pinene was isomerized at the reflux temperature in the presence of 1 to 5% of calcined Attapulgus clay or cobalt molybdite catalyst. The progress of the reaction was followed by infrared analysis. Camphene and dipentene are primary products formed directly from α-pinene by relatively fast reactions. Other monocyclic terpenes and terpene dimers and polymers are formed by relatively slow secondary reactions, principally from the dipentene. This reaction sequence is compatible with the carbonium ion mechanisms that have been advanced by Kharasch and by Mosher. Hydrogenation of the cobalt molybdite catalyst results in increased yields of camphene and greatly reduced polymerization. A mechanism is proposed to account for the formation of camphene as the chief product under conditions of heterogensous acid catalysis, whereas dipentene and other monocyclic terpenes result in the homogenous acid—catalyzed isomerization. The isomerization is pictured as a concerted reaction, involving exchange of hydrogen between the surface and the pinene, while the α-pinene is held in a rather fixed configuration on the catalyst surface.

Rate of Dimerization of Allo-Ocimene

by J. E. Hawkins and R. E. Fuguitt, Department of Chemistry, University of Florida.

Previous publications have demonstrated the nature of the various reactions which take place when α-pinene is thermally isomerized in the liquid phase at about 200°. These reactions include the simultaneous isomerization of α-pinene to dipentene and allo-ocimene, each reaction being first-order. It has been shown also that optically active α-pinene racemizes by a first-order reaction. In addition, the results conclusively proved that allo-ocimene dimerizes to about 90% completion, while at the same time small amounts of allo-ocimene cyclize to form α- and β-pyronenes. The rate constants of the isomerizations and the racemizations have been reported previously.

The present paper covers the rate of dimerization of the allo-ocimene, the values of the equilibrium constant, the heat of the reaction, and the heats and entropies of activation for the opposing reactions.

The dimerization is shown to follow a second-order rate equation, with rate constants of 8.4×10^{-4} and 1.8×10^{-3} lieter mole^{-1} min.$^{-1}$ at 189.5° and 204.5°, respectively. The equilibrium constants are 6.7 and 5.6 liters mole^{-1} at 189.5° and 204.5°, respectively. The heat of the reaction is -5320 cal. and the heat of activation is 22,400 cal. The entropy of activation is -16.5 e.u. per mole of dimer found.

New Amino Acids From Turpentine

by B. A. Parkin and G. W. Hedrick, Naval Stores Research Section, Naval Stores Station, Olustee, Fla.

Work on the study of the reactions of pinonic acid and homoterpenyl methyl ketone has included an investigation of the behavior of these materials in the Schmidt reaction with hydrazoic acid. Only the reactions involving the methyl ketone group are reported.

Pinonic acid has been prepared by numerous authors by oxidation of alpha-pinene. In acid aqueous media this acid rearranges to give homoterpenyl methyl ketone. Under the conditions of the Schmidt reaction—concentrated sulfuric acid at low temperature—rearrangement takes place readily. Ethyl pinonate behaves similarly.

In the Schmidt reaction by simultaneous addition of the ketone and hydrazoic acid to concentrated sulfuric

acid at 0° to 5°C. homoterpenyl methyl ketone reacts to give a good yield of a product consisting of a mixture of 3-(1-hydroxy-1-methylethyl)-5-acetylaminc pentanoic acid lactone (88 to 90%) and N-methylhomoterpenylamide (10 to 12%), from which acetic acid, methylamine, homoterpenylic acid, and the hydrochloride of the amino acid lactone were isolated and characterized. The free amino acid rear-ranges readily to the lactone 4-isopropanol-2-piperidone, which by reduction yielded a previously reported 4-isopropanol piperidine.

With the conditions used pinonic acid and its ethyl ester reacted with hydrazoic acid to give good yields of a product consisting of 2,2-dimethyl-3-acetylaminocyclobutane acetic acid and its ester (88 to 90%) and N-methylamide of pinic acid and its ester (10 to 12%), from which acetic acid, methylamine, pinic acid, and the hydrochloride and the free amine—2,2-dimethyl-3-aminocyclobutane acetic acid—were isolated and characterized.

Products of Pinane Hydroperoxide

by R. K. Madison and G. K. Bellis, Stamford Laboratories, Research Division, American Cyanamid Co., Stamford, Conn.

The Criegee rearrangement of pinane hydroperoxide esters has been shown to give a hydroxyketone, $C_{10}H_{18}O_2$, the structure of which has been proved by synthesis and infrared data to be 2,2-dimethyl-3-acetycyclobutane-ethanol. The decomposition of pinane hydroperoxide by stoichiometric amounts of a ferrous salt has been shown to lead to a diketone, $C_{20}H_{34}O_2$. The structure of this diketone has been shown by synthesis and infrared data to be 1,4-bis [2,2-dimethyl-3-acetylcyclobutyl] butane.

Terpene Polymers

by P. O. Powers, Pennsylvania Industrial Chemical Corp., Clairton, Pa.

Many mono- and bicyclic terpenes give polymers on treatment with acid catalysts. However, only beta-pinene has been used in large quantities to produce hard thermoplastic resins. These resins have found increasing commercial acceptance in the last two decades, and now represent an important application of beta-pinene.

The structure of the terpene polymers has not been entirely clarified, although it is apparent the cyclobutane ring in the beta-pinene structure is opened. Whether resin formation is a polyalkylation reaction or a vinyl polymerization has not been established, although evidence is available for either reaction. The commercial resins have molecular weights up to 1200 and a rather narrow distribution of polymers.

Commercial resins have good color and melt from 10° to 135° C. Physical properties of various resins are described. The resins find application in adhesives, coatings, rubber compounding, and many other industrial fields.

Terpene Adducts and Phenolics

by P. O. Powers, Pennsylvania Industrial Chemical Corp., Clairton, Pa.

Terpenes react readily with maleic anhydride; the conjugated menthadienes as alpha-terpinene react readily at room temperature. At higher temperatures the monocyclic terpenes react to form similar adducts. Apparently the terpenes isomerize in presence of the maleic anhydride to the conjugated form, which react to form the adduct. Bicyclic terpenes as the pinenes also react under more severe conditions to give an adduct. The dibasic acid adduct may be used in preparation of oil-modified alkyds, and for ester plasticizers. These resins have found several special applications.

Terpenes add readily to phenol in the presence of acid catalysts. Terpene alcohols, mono- or bicyclic terpenes can be used to alkylate phenol to produce hard thermoplastic, oil-soluble resins. These can be condensed with formaldehyde or other carbonyl compounds to produce resins of somewhat higher softening point.

If the ratio of terpene to phenol is not too high, the resulting resin is soluble in alcohol and in hydrocarbon solvents. At higher ratio of terpene the resin is not alcohol-soluble, but readily soluble in hydrocarbons.

The terpene phenolic resins have found application in coatings, wax emulsions, shellac substitutes in adhesives, and many other uses.

Improved Tall Oil Fatty Acids

by C. S. Nevin and C. R. Young, American Cyanamid Co., Stamford, Conn.

A chemical process has been developed for treating distilled tall oil fatty acids, which reduces the color to a Gardner value of 1-2 and improves considerably the drying characteristics.

The process consists of reaction of tall oil fatty acids with 0.3% zinc dust at 235°C. for 30 to 40 minutes under an atmosphere of nitrogen. The unreacted zinc is removed, and the treated fatty acids are vacuum-distilled. A yield of 97% product and 3% residue is obtained.

The product has good color stability, and analyses show that the gross chemical composition of the fatty acids mixture is essentially unchanged. Alkyd resins made from the product have drying characteristics superior to alkyds made from untreated tall oil fatty acids and equivalent to alkyds made from more expensive rapid-drying commercially available distilled fatty acids.

Improved Rosin Esters Through Epon Resins

by R. E. Dunbar and M. F. Dante, Shell Chemical Corp.

This paper describes the use of Epon resins in conjunction with rosin and rosin-containing fatty acids to impart desirable properties to the types of vehicles normally produced from these readily available, economical raw materials. As resinous polyhydric alcohols, Epon resins are employed in the preparation of these vehicles much in the same manner as other polyhydric alcohols—e.g., glycerol and pentaerythritol. With rosin or rosin-containing fatty acids, the essential reaction is esterification.

Procedures are presented for the preparation of Epon resin tall oil esters, Epon resin tall oil phthalic alkyds, and various types of Epon resin in situ varnishes. The properties of the vehicles and formulated finishes are compared to the properties of conventional coating materials. Practical applications discussed include the use of these vehicles as utility varnishes, and as vehicles for floor varnishes, washing machine primers, and automotive primers.

Comparison of Glycerol and Pentaerythritol Alkyds

by G. R. Somerville, Shell Chemical Co., New York, N. Y.

The purpose of this work was to compare, under practical conditions, the water and dilute-alkali resistance of comparable long-oil alkyd resins formulated from glycerol and from pentaerythritol.

Data show moisture vapor transmission rates of films made from a maleic-modified glycerol long-oil alkyd and from a pentaerythritol long-oil alkyd. These products are formulated and processed in such a way as to yield products having essentially the same viscosity and acid number at the same oil length—60%.

The maleic-modified glycerol alkyd is equal to the pentaerythritol alkyd in moisture permeability. Further data include a comparison of alkyds in the 50 and 40% oil-length range. A 40% oil-length series covers baking vehicles using a conventional amount of urea-formaldehyde resins.

Data are shown on primer films made with these alkyds, demonstrating detergent resistance, such as that required of appliance finishes, with and without top coats. Data on storage stability, skinning tests, and flexibility retention on aging are included.

Isophthalic Alkyds

by H. L. Wampner, Pacific Coast Division, Reichhold Chemicals, Inc., South San Francisco, Calif.

Isophthalic acid, a newly available commercial chemical, has been studied for use in alkyd resins over the past ten years. While an isomer of the commonly used orthophthalic acid, or phthalic anhydride, it produces significantly different characteristics in the products containing it. It has a higher effective functionality than orthophthalic acid and, consequently, yields resins which body faster and cook to a higher viscosity than resins made from the ortho isomer. Taking advantage of this characteristic in isophthalic acid, it is possible to

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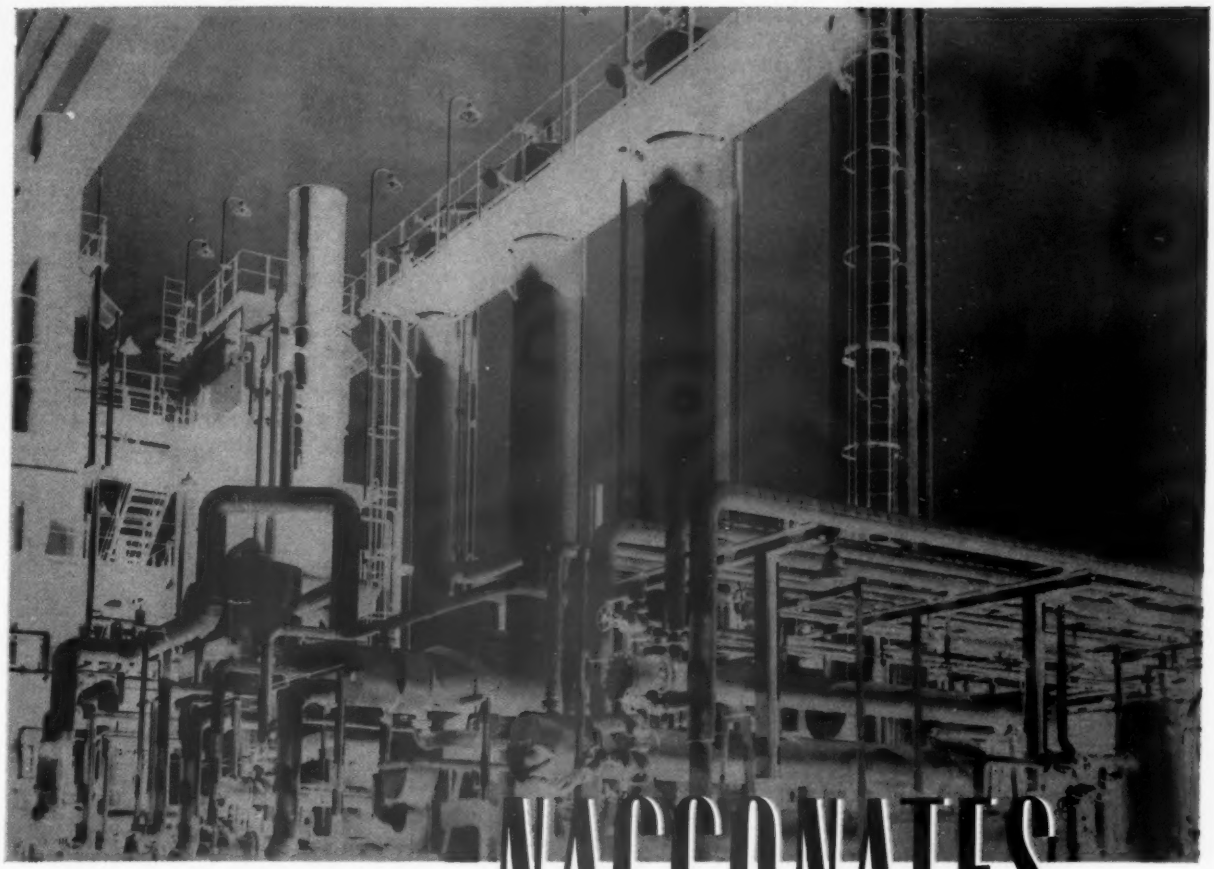

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formulate alkyd resins with interesting commercial characteristics which cannot be duplicated with the ortho isomer. A comparison of resins made with the ortho and iso isomers on a truly comparable basis shows the isophthalic acid gives somewhat better drying, flexibility, toughness, and gloss retention on exposure. It is probable, however, that the big use for isophthalic acid in alkyd resins will be in those fields where it shows marked superiority over the orthophthalic in producing resins of unusual types.

Mixture of Undecanedioic and Dodecanedioic Acids

by T. R. Steadman and J. O. H. Peterson, National Research Corp., Cambridge, Mass.

Nitric acid oxidation of 12-hydroxystearic acid or its methyl ester has been shown to give yields of a mixture of dodecanedioic and undecanedioic acids as high as 98.5% under controlled conditions. The crude product was purified either by conversion to the corresponding methyl esters, which could be fractionated in vacuo, or by recrystallization from toluene or acetic acid. Mixtures of dodecanedioic and undecanedioic acids were also made in yields as high as 57% by the alkali cleavage of 12-hydroxystearic acid with cadmium oxide present. A competing reaction made the attainment of higher yields seem unlikely.

The di-2-ethylhexyl ester of this mixture of dibasic acids was a good plasticizer for poly(vinyl chloride). The ester also proved to have a viscosity index substantially higher than that of di-2-ethylhexyl sebacate, but its melting point was too high to allow its use as a synthetic lubricant for military purposes.

The Molecular Approach to Alkyd Structure

by W. M. Kraft, Heyden Chemical Corp., Garfield, N. J.

The molecular approach to alkyd structure and formulation is suggested as a more suitable basis of comparison of polyol ingredients than the equal phthalic or equal oil length concepts previously used. In this paper glycerol, trimethylolethane, and trimethylolpropane are compared in alkyd resins in which the molecular ratio of phthalic-polyol is held constant at 1 to 1 and where the moles of fatty acid are varied.

At the same molar content of fatty acid the molecular approach alkyds made from the various polyols show similar viscosity, hardness, and dry time, indicating a similarity in gross resin structure. Observations are also made concerning alkali and detergent resistances fro the various alkyds.

Calculations and resin and film data from alkyds made using the equal phthalic and equal oil bases indicate that the characteristics of the systems are not as comparable as in the molecular basis.

Observations are also offered on the effects of hydroxyl excess on water resistance properties of some typical alkyds made from the polyols as well as on the differences between phthalic and isophthalic resins.

Maleic Modification of Acid Refined Tall Oil Varnishes

by E. E. McSweeney and E. R. Mueller, Battelle Memorial Institute, Columbus, Ohio, and R. K. Brandt, Ironsides Corp., Columbus, Ohio.

Formation of minor amounts of insoluble material during cooking of maleic-modified tall oil esters can be prevented by either of two methods: (1) pre-esterification of tall oil with polyol before maleic addition; or (2) reaction of maleic and tall oil at 450°F. until a negative dimethylaniline test for free maleic is obtained. The

latter method is preferred because it is somewhat faster.

General Remarks on the Alkyd Field

by E. S. Pattison, Glycerine Producers' Assoc., New York, N. Y.

Formulation of alkyd resins in protective coatings is subject to different trends in each of the following fields of use: (1) metal protection, (2) product finishing, (3) exterior house paints, and (4) interior home decoration. In (4) the challenge of vinyl and acrylic latices, as well as the rubber latex water-base paints, has had its greatest success. In (3) potential expansion of alkyds appears still to be great, particularly with isophthalic acid in long-oil modifications, and with more advances in mildew and blister resistance. In (2) copolymers and combinations of alkyds with other vehicles put new emphasis on the compatibility characteristcis of the alkyd and its ingredients with vinyls, phenol-formaldehyde, melamines, epoxys, etc. So-called plastic-type furniture finishes are a case in point. In (1) baking alkyds and the hard spray or roller-coat for structural metal, etc., no challenge to alkyd vehicles affecting their formulation is seen.

Neopentyl Glycol Saturated Polyesters

by E. W. Wilson and W. M. Gearhart, Eastman Chemical Products, Inc., Kingsport, Tenn.

Based on the industrial application of the oxo reaction, neopentyl glycol (2,2-dimethyl-1,3-propanediol) has been introduced as a new chemical available in commercial quantities. In addition to applications in unsaturated polyesters and polyurethane plastics, this compound finds wide potential in the field of saturated polyesters for poly(vinyl chloride) plastics applications.

The synthesis of neopentyl glycol polyester is shown to be straightforward and can be carried out in conventional equipment and under conventional conditions of esterification polymerization. Useful products of low color, good heat stability, a high degree of resistance to hydrolysis, and excellent electrical properties can be synthesized.

Results are reported of studies made on the effects of terminating alcohol and acid groups on these neopentyl glycol-adipic acid polyesters. Generally, the alcohol-terminated polyesters of 1000 to 1500 molecular weight are preferred.

The effect of varying dibasic acids was also shown. With increasing dibasic acid molecular weight of adipic to sebacic, better low temperature properties were obtained but at the expense of good processing properties.

Typical properties of a neopentyl glycol—adipic acid polyester terminated with 2-ethylhexanol are given for the polyester *per se* and also for the poly(vinyl chloride).

Polymerized Fatty Acid Polyesters

by D. T. Moore, R. H. Boehringer and M. H. Smith, Application Research Section, Emery Industries, Inc.

In the past several years, the reaction products of polyesters and isocyanates—the so-called "polyurethanes"—have become of increasing commercial importance and have been recommended for use in adhesives, coatings, foams, fibers, etc.

Polyesters for the production of foams have usually been based on adipic acid. Although these foams have been useful, they have exhibited certain weaknesses, among them being poor color retention and considerable susceptibility to hydrolytic degradation. Polyesters have been prepared from polymerized fatty acids and formulations worked out that result in excellent foams from them. These foams have improved color retention, greater resistance to hydrolysis, and load-deflection characteristics more nearly like those of foam rubber.

The roles of other foam ingredients (isocyanate, water, catalyst, emulsifier) are discussed and data are presented to illustrate the effects produced as variations are made in each. Optimum, or near-optimum, values are given. The results of physical testing of a number of polymerized fatty acid polyester foams are presented and the values compared to typical values obtainable with foams of other types.

(*From page 32*)

Modified Emulsion Vehicles

The question arose how far might it be possible to increase the uniformity of the films in their resistance to the ultraviolet radiation by combining the materials already in the three dimensional state in emulsion with materials which are, as film formers, still in a soluble state, such as alkyd-modified paints.

When styrene-butadiene latex paints or polyvinyl acetate latex paints were used in such modification, the formation of the color spots on the panel surfaces under ultraviolet light exposure was eliminated. The degree of surface discoloration has also been decreased, as shown in Tables 8 and 9.

Apparently the modifiers result in a more uniform and closely knit film. Therefore, corresponding mixtures between hiding and non-hiding pigments are less affected by radiation than films based on only emulsion polymers.

Since this part of the work employed an alkyd resin as modifying agent only, no general statement can be made at this time about the actual role which such film formers play in upgrading emulsions. But with the fact that the washability of such materials was also found to be of a higher order, let us assume that they actually provide for a more uniform setting of the particles in the film. This would be in agreement also with their behavior under ultraviolet radiation.

Differences have been established in the behavior of films based on soluble film formers, the films produced from water emulsion polymers and the films produced from a combination of both in their behavior to ultraviolet radiation.

To further clarify the behavior of the three types of films, the measurements have been compared also by using for each paint its initial whiteness as 100% for this paint and plotting the decrease in whiteness versus time of exposure. These results are shown in Figures 4, 5 and 6. They show that the soluble vehicles show very little decrease in whiteness under the test conditions, except in the case where the reactive vinyl group has been introduced. Figure 5 shows that water dispersions of pre-polymerized material are more affected with the change in hiding power of the pigmentation and that latices with additional available double bonds show this to a higher degree. In the case of dispersions of pre-polymerized matter in water dispersions of alkyds, only a very low degree of hiding power shows a great effect.

The author wishes to express his appreciation for the cooperation which he received from the Wet Ground Mica Association and from the American Lecithin Company. He thanks his co-workers, Edward J. Dypa, Arthur H. Staheli and Matthew King for the laboratory developments of this investigation.

References

(1) Kronstein, M., Muschett, R. W. Jr., Dypa, E. J., Staheli, A. H., "Studies on the Uniformity in the Formulation of Latex Paint Films" in Industrial and Engineering Chemistry, **47**, 2181 (1955).
(2) Beardsley, H. P., "Polyvinyl Acetate Emulsion-Base Paints" in Official Digest, Federation of Paint and Varnish Production Clubs, Vol. 27, No. 363 (April 1955).

DIPPING DEVICE

(*From page 47*)

The device will reproducibly dip-coat 20 *gauge*, 4" x 12" mild steel panels at rates that may be varied from one to ten inches per minute or higher. A perfectly uniform coating surface is obtained along the length of the panel due to the smoothness of action of the synchronous motor. More important, it is usually found that only very slight wedge effects are obtained in the thickness of coating along the panel over fairly wide ranges of application conditions. A few representative examples of the film thickness variations that may be expected using this device are shown in Table I.

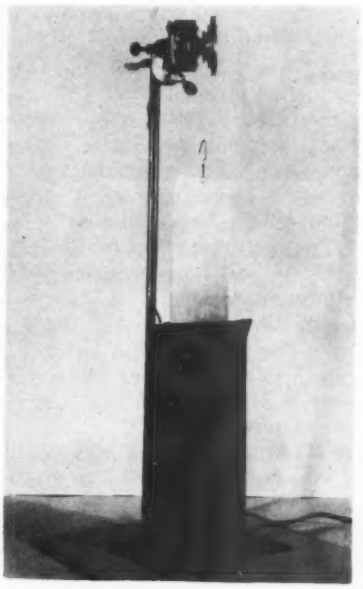

Figure 1. Dipping Device

The instrument may also be used for the simultaneous dip-coating of a number of smaller panels. This is done simply by hooking the panels to a horizontal yoke which is in turn connected to the pulley.

[1]Herbach & Rademan, Inc., 1204 Arch St., Philadelphia 7, Pa. Cat. No. HI-1, Synchron High Torque Timing Motor, $4.95. (CAUTION—Gears should not be forced.)

[2]The pulley is custom made and should be hollow ground to keep weight down. Pulley diameters are calculated to give the desired dipping rates.

[3]Four-pound test line is adequate and can be obtained in any sporting goods store.

Goodyear Opens New Office

The chemical division of the Goodyear Tire and Rubber Co. has opened a new field office at 6500 Mt. Elliott Ave., Detroit, according to an announcement by C. O. McNeer, general sales manager of the division.

The new office will be headed by L. P. Thies, who has been associated with the division's Cleveland office for the past year.

The Detroit office offers technical sales service for rubber, plastic and coating materials sold by the chemicals division.

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Michigan Chemical Elections

Theodore Marvin was re-elected president and chairman of the board of Michigan Chemical Corp. at the annual organizational meeting.

Also re-elected were Fred A. DeMaestri, vice president; R. J. Knapp, secretary and treasurer, and Josephine M. Curtiss, assistant secretary and assistant treasurer. Philip C. Cavanagh was also elected assistant secretary and assistant treasurer.

Mr. Marvin announced the start of two new plants, a bromine and bromide unit at El Dorado, Ark., and rare earth facilities at Saint Louis, Mich.

At the firm's annual stockholders' meeting, 10 members of the board of directors were re-elected, and two additional members were elected to increase the size of the board from 10 to 12.

OUTDOOR EXPOSURE

(*From page 41*)

on many types of acrylic paints have been conducted. The results of these studies are helpful to paint formulators engaged in designing exterior coatings based on acrylic emulsions. These exposure series indicate that pigment volume concentrations ranging from 30 to 50% will give good results. For masonry surfaces there is little choice between 50% and 30% pigment volume content on a performance basis if the surface is sound but paints with a higher pigment content are lower in cost.

Low pigment volume paints have an advantage in adhesion over chalky surfaces compared to high pigment volume paints. For application to pine and other woods which tend to graincrack severely the lower pigment volume paints with 30% pigment volume give better results than paints with higher pigment volumes.

The formulator should take considerable pains to select a suitable ratio of non-chalking to chalking type titanium dioxide as this ratio controls to a large extent the appearance of the finished paint job. For white paints in Northern United States considerably more chalking type titanium dioxide should be used than for Southern exposure. The common range is 60-80% non-chalking rutile pigment with the balance being semi-chalking or free chalking anatase for Northern exposure. For Southern exposure the ratio may be 90% non-chalking and in some cases 100% non-chalking rutile titanium dioxide.

For extenders ground calcium carbonate and talc seem to be preferred. The talc gives an advantage in reduced staining when iron is present. A mixture of talc and calcium carbonate has often been used in the high pigment volume systems.

A good preservative both for preservation of the paint in the can and for preserving the film should be included. Manufacturers recommendations should be consulted and concentrations in the range of 0.5-1.0% are not at all uncommon where mildew conditions are bad.

Suggested Test Formulations

A series of four test formulations has been designed for those who would like to conduct further exposure tests on acrylic emulsion paints. These are based on the exposure work reported here and should give good starting points for the development of commercial exterior acrylic emulsion paints. These formulations are given in Table I.

Durable paints for exterior masonry surfaces have been developed using commercial acrylic emulsions. These paints have given outstanding service in many parts of the country on porous, highly alkaline, cement, cinder block and asbestos shingle surfaces as well as on asphalt and cement tile roofs. These paints have outstanding drying speed, alkali resistance, water resistance, color retention and durability properties.

The author acknowledges the efforts of Dr. W. C. Prentiss and Mr. R. Stankus of the Rohm and Haas Research Laboratories who supplied the panel exposure data used in this report.

TECHNICAL Bulletins

ISOPHTHALIC ACID ALKYDS

Complete descriptions and detailed specifications of isophthalic acid alkyds are included in a brochure published by Reichhold Chemicals, Inc., Advertising Dept., Dept. PVP, RCI Building, White Plains, N. Y.

Products described are named Super-Beckosols. Included is 1350, a very long isophthalic alkyd resin designed especially for exterior house paints, trim paints, tinting base vehicles and other applications where low viscosity and high solids resin with excellent brushing characteristics is desired.

Also described are 1351-70 for architectural, trim and trellis enamels and exterior steel paints, 1352-60 for industrial coating applications including automotive finishes, and 1353-50, an unusual short oil alkyd for automotive finishes of the baked type.

SYNTHETIC RESINS

A bulletin from Holland describes Setal 126, a short oil dehydrated castor oil alkyd resin for stoving purposes, and Setal 1956, a binder for flat wall finishes.

Setal 126 is compared to a number of similar products both by the same firm and by a German manufacturer. Compared were characteristics and properties including hardness, gloss, yellowing, elasticity and others.

Setal 1956 is compared to Setal 1952. The newer resin is said to possess all of the other's good properties, while the price is considerably lower.

Called Synthese Guide, the bulletin is available from Kunstharsfabriek Synthese N/V, Kortenaerkade 38, Katwijk Aan Zee, Holland.

PLASTICS DATA

The revised fifth edition of "Technical Data on Plastics," an industry handbook describing and cataloging properties of all commercially available plastics, has been issued by the Manufacturing Chemists' Assoc., Dept. PVP, 1625 Eye St., N. W., Washington 6, D. C.

Enlarged to 224 pages, the new edition lists graphical and tabular data on fabrication, durability, electrical, mechanical and miscellaneous properties of 25 types of plastic materials.

Featured in the publication is a chapter on "Designing Plastics for Strength" by Professor A. G. H. Dietz of M.I.T. Price of the book is $3.25 per copy.

AIR MATERIALS RESEARCH

A publication released through the Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C., includes 145 reports of research conducted under the Air Force's materials research and development program from July 1, 1955 to June 30, 1956.

The publication contains abstracts of research in adhesives, metallurgy, analysis and measurement, biochemistry, textiles, petroleum products, plastics, packaging, protective treatments and rubber.

The report is PB 111648-S2, *A Review of the Air Force Materials Research and Development Program*, H. E. Hines and R. F. Walden, Wright Air Development Center, U. S. Air Force, Oct., 1956. It contains 94 pages and is priced at $2.50.

CLASSIFIED ADVERTISEMENTS

Rates: $.20 per word, except those seeking employment, for which rate is $.10 per word. Minimum: ten words. Address all replies to Box Number, c/o Paint and Varnish Production, 855 Avenue of the Americas, New York 1, New York.

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BOX CLOSURE METHODS

"A Guide to Better Closures," specially prepared for users of fibreboard boxes and packages, has been published by Acme Steel Products Division, Acme Steel Co., Dept. PVP, 135th & Perry Ave., Chicago 27, Ill.

The brochure is intended as a guide for the evaluation of methods currently in use to effect economies and stepped-up production in the closure of fibreboard boxes.

Closure methods such as hand and machine gluing, taping, stapling and wire stitching are discussed along with advantages and disadvantages of each. Included is a special section on regulations for sealing fibreboard containers.

The brochure also contains a section on wire stitching for all kinds of fibreboard boxes, and brief descriptions of the firm's Arcuate and Circuate stitching methods.

REPORTS AND ANALYSES

The Chemical Specialties Research Laboratories, Dept. PVP, Box 33, Ansonia Station, New York 23, N. Y., has announced the availability of its 1957 catalog listing reports on more than 1500 tradename chemical specialties.

Chemical specialty manufacturers who do not have facilities for making their own analyses can now obtain prepared reports inexpensively. In addition, a monthly service which provides five new analyses each month is offered on a subscription basis.

DOWICIDE PRESERVATIVES

A bulletin titled "Dowicide Preservatives in the Paint and Varnish Industry" is available from the Dow Chemical Co., Dept. PVP, Midland, Mich.

The bulletin covers both latex and oil paint. For latex paint the bulletin covers the preservation problem, plant sanitation, shelf preservation, addition of Dowicide products to latex paints and stability of the Dowicide solution.

For oil paints the bulletin discusses the mold problem, preventing mold growth on oil paint films, applying mold-resistant paints and addition of preservatives to oil paint and varnish.

Also included with the bulletin are a number of Dowicide production data sheets.

CALENDAR OF EVENTS

June 17-19—Annual meeting, ASTM Committee D-1, Chalfonte-Haddon Hall, Atlantic City, N. J.

August 19-23—Organic Coatings Conference, 1957 Gordon Research Conferences, Kimball Union Academy, Meriden, N. H.

October 30- November 2—Annual Convention, Federation of Paint and Varnish Production Clubs, and Paint Industries' Show, Bellevue-Stratford Hotel, Philadelphia, Pa.

Production Club Meetings

Baltimore, 2nd Friday, Park Plaza Hotel.

Chicago, 1st Monday, Furniture Mart.

C.D.I.C., 2nd Monday.
Cincinnati — Oct., Dec., Mar., May, Hotel Alms.
Dayton — Nov., Feb., April, Suttmilers.
Columbus — Jan., June, Sept., Fort Hayes Hotel.

Cleveland, 3rd Friday, Harvey Restaurant.

Dallas, 1st Thursday after 2nd Monday, Melrose Hotel.

Detroit, 4th Tuesday, Rachham Building.

Golden Gate, 3rd Monday, El Jardin Restaurant, San Francisco.

Houston, Monday prior 2nd Tuesday, Ship Ahoy Restaurant.

Kansas City, 2nd Thursday, Pickwick Hotel.

Los Angeles, 2nd Wednesday, Scully's Cafe.

Louisville, 3rd Wednesday, Seelbach Hotel.

Montreal, 1st Wednesday, Queen's Hotel.

New England, 3rd Thursday, University Club, Boston.

New York, 1st Thursday, Brass Rail, 100 Park Ave.

Northwestern, 1st Friday, St. Paul Town and Country Club.

Pacific Northwest, Annual Meetings Only.

Philadelphia, 3rd Wednesday, Philadelphia Rifle Club.

Pittsburgh, 1st Monday, Gateway Plaza, Bldg. 2.

Rocky Mountain, 2nd Wednesday.

St. Louis, 3rd Tuesday, Kings-Way Hotel.

Southern, Annual Meetings Only.

Toronto, 3rd Monday, Oak Room, Union Station.

Western New York, 1st Monday 40-8 Club, Buffalo.

FILTERS

An eight-page brochure illustrates six major filter types for industrial applications.

Filters offered include disposable media gravity type, combination gravity and magnetic, straight magnetic, vacuum, pressure and screen-type settling filters. Vacuum and pressure filters utilize permanent filter media which permits use of diatomaceous earth for precoating filter elements.

Filter applications include all types of fluids from water to heavy viscosity oils and lubricants. Complete descriptions of filter operation are given, as well as applications, degree of filtration and flow rate capacities.

Brochure is available from George L. Guymon, Vice President and Director of Sales, Industrial Filtration Co., Dept. GB-333, Lebanon, Ind.

INDUSTRIAL CHEMICALS

An attractive, 22-page color-illustrated booklet contains a listing of industrial chemicals produced by The Harshaw Chemical Co., Dept. PVP, 1945 East 97th St., Cleveland 6, Ohio.

Also included in the publication is a listing of sales branches and warehouses, sales offices and plants.

The booklet presents a brief history of the firm, and includes photographs of its plants.

JAR ROLLING MACHINES

An eight-page, extensively illustrated catalog has been published covering a line of jar rolling machines, porcelain and metal jars, grinding media and other processing equipment.

Fully illustrated are style M-single tier jar rolling machine, style P-two-tier jar rolling machine, style Q-three-tier jar rolling machine, and style S-four-tier jar rolling machine.

Grinding media included are flint pebbles, porcelain balls and chrome steel balls.

Titled Catalog No. 79, publication is available from Abbe Engineering Co., Dept. PVP, 50 Church St., New York 7, N. Y.

FIRE EXTINGUISHER CHART

A chart on "How to Select A Fire Extinguisher" is available from the Fire Equipment Manufacturers' Assoc., Inc., Suit 759, One Gateway Center, Pittsburgh 22, Pa.

The chart lists basic types of extinguishers and shows at a glance which to use against the three classes of fire: Class A-wood, paper, rubbish, etc.; Class B-volatile liquids; Class C-electrical fires.

The effects of temperature, operating ranges for each type of extinguisher, how the extinguishing agents kill fire, and other information are included in the chart.

SURFACE ACTIVE AGENTS

A bulletin on the rapidly expanding field of surface active agents has been published by American Cyanamid Co., Manufacturers Chemicals Dept., Dept. PVP, 30 Rockefeller Plaza, New York 20, N. Y.

The bulletin gives technical data on the seven types of "Aerosol" surface agents offered in commercial quantities by Cyanamid, including their use in basic formulations, data for testing effectiveness and information on storage and handling.

Information on how surface active agents are used in the manufacture of many specialty products is also included as suggestive of the uses to which the agents may be put.

The bulletin is attractively designed for easy reading, and contains many charts, graphs and tables.

STEARIC ACIDS

"Emersol Stearic Acids" is the title of a 24-page booklet being offered by Emery Industries, Inc., Dept. PVP, Carew Tower, Cincinnati 2, Ohio.

The brochure is designed to aid in the selection of the proper grade of stearic acid for each end use. It interprets the results of analytical tests commonly performed on stearic acids, and contains a discussion of physical properties of commercial stearic acids and their relation to its palmitic stearic acid ratio.

Tables are given listing the composition of typical grades of stearic acid, as well as a stearic acid selection chart. Also included are a section covering the handling of stearic acid, and a complete description of all grades of Emersol Stearic Acids.

ADVERTISERS' INDEX

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CYCOPOL S 201-1 — for superior gloss and gloss retention, excellent flow, color and color retention, and infinite solubility in aliphatic hydrocarbon solvents in interior architectural white enamels.

CYCOPOL 341-17 — a very fast drying copolymer resin supplied in V M & P Naphtha for aliphatic solvent tolerance, for use in paper and polystyrene coatings, implement enamels, traffic paints and floor finishes.

Data sheets and samples on request.

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